

A photograph of a large industrial crane, likely a lattice boom crane, painted in a vibrant red color. The crane is shown from a low angle, looking up at its tall mast and complex lattice boom. Multiple thick cables or ropes are visible hanging from the boom. The background is a clear, light blue sky.

SIEMENS

Description and Tutorial
for

SIMOCRANE
Drive-Based Technology V1.0 SP1 HF1
with Sinamics CU 310-2

Siemens Cranes
Product Management
February 2013, Erlangen, Germany

SIMOCRANE Drive-Based Technology V1.0 SP1 HF1

Overview

Siemens Solution for Mid-Performance Crane Application

- A drive-based solution in SINAMICS environment
- Special Sinamics Firmware for Cranes application
- Crane specialized technologies in DCC-blocks
- Preconfigured standard applications (Ready-to-Run)
- Open for customized adaption (Ready-to-Apply)

MC Cranes

Our product portfolio

SIMOCRANE

Platform

Crane Technology

Crane Management System

Advanced Technology

Basic Technology



(Remote) CMS



Sway Control



Skew Control



2D-Trajectory



Truck Position System



ECO Technology



Basic Technology V3.0

Mid Performance



CMS Lite



Drive-Based Technology

Motion Controller



SIMOTION D435-2

Drive Controller



CU320-2



CU310-2

Drives



Crane Cabinet Modules



Chassis



Book-size



PM340



PM250

Motors

1LA8/
1LL8

1PH8



1LG4/6



1LP4/6

Product Introduction

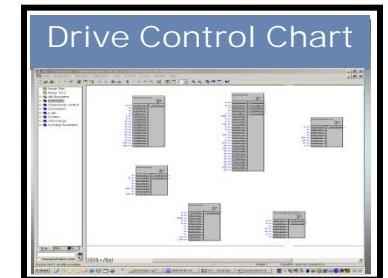
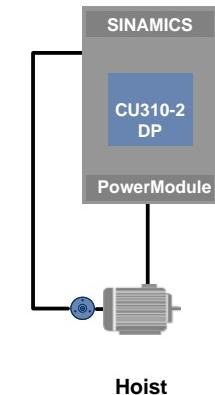
Functional Scope (1)

Product Scope

- **Crane midrange solution is**
 - A Sinamics AC/AC Single axis drive (power module),
 - Control Unit CU310-2,
 - A special Sinamics FW V4.5 for Cranes and
 - Simocrane Drive-Based Technology V1.0 SP1 HF1.

- **This special Firmware can operate**
 - With PM340
 - With PM Chassis
 - With PM250
 - With Safety functions
 - without Servo-Control.

- **Crane technology in DCC-Blocks**
 - Load-dependent field weakening
 - Pre-limit switch (selectable limiting)
 - Start pulse
 - Master switch
 - Over-speed monitoring (not a fail-safe function)
 - Current distribution monitoring (for double Axes)



Functional Scope (2)

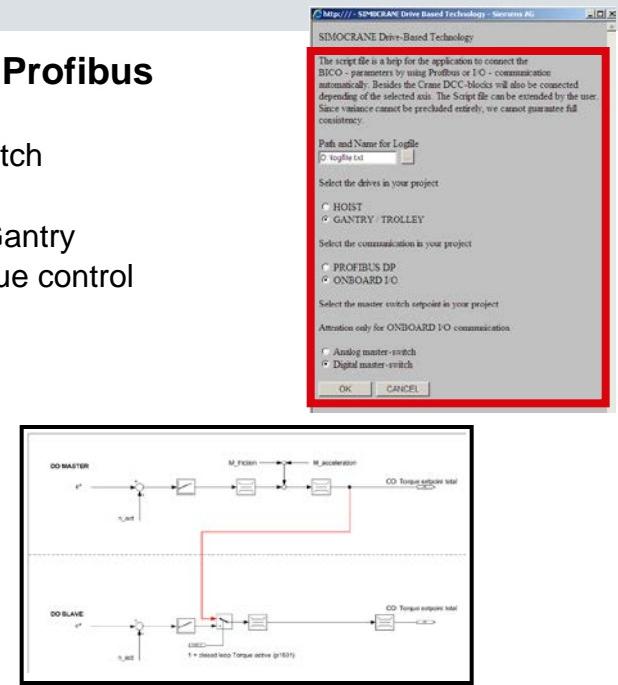
Product Scope

- **Standard applications via I/O-onboard or via Profibus**

- Selectable via I/O-onboard or via Profibus
- Selectable with analogue or digital master-switch
- Combination of Startpulse with brake control
- SingleAxis application for Hoist or Trolley or Gantry
- DoubleAxes application for Master-Slave torque control
- Configuration via scripting

- **Sinamics functionality**

- Time-optimized positioning for a single axis
- Master-slave closed-loop torque control
- Brake control
- Integrated Safety



- **The Crane DCC-chart is know-how protected, therefore, it can not be opened. The customized DCC application can be made in another DCC-chart under other Drive-Object (e.g. CU).**
- **There is no online-help in Sinamics Starter for user defined parameters.**
- **The grab function and synchronous operation are not parts of this product.**

Scope of Supply

Product Scope



V1.0 SP1 HF1

Memory card (CF card)

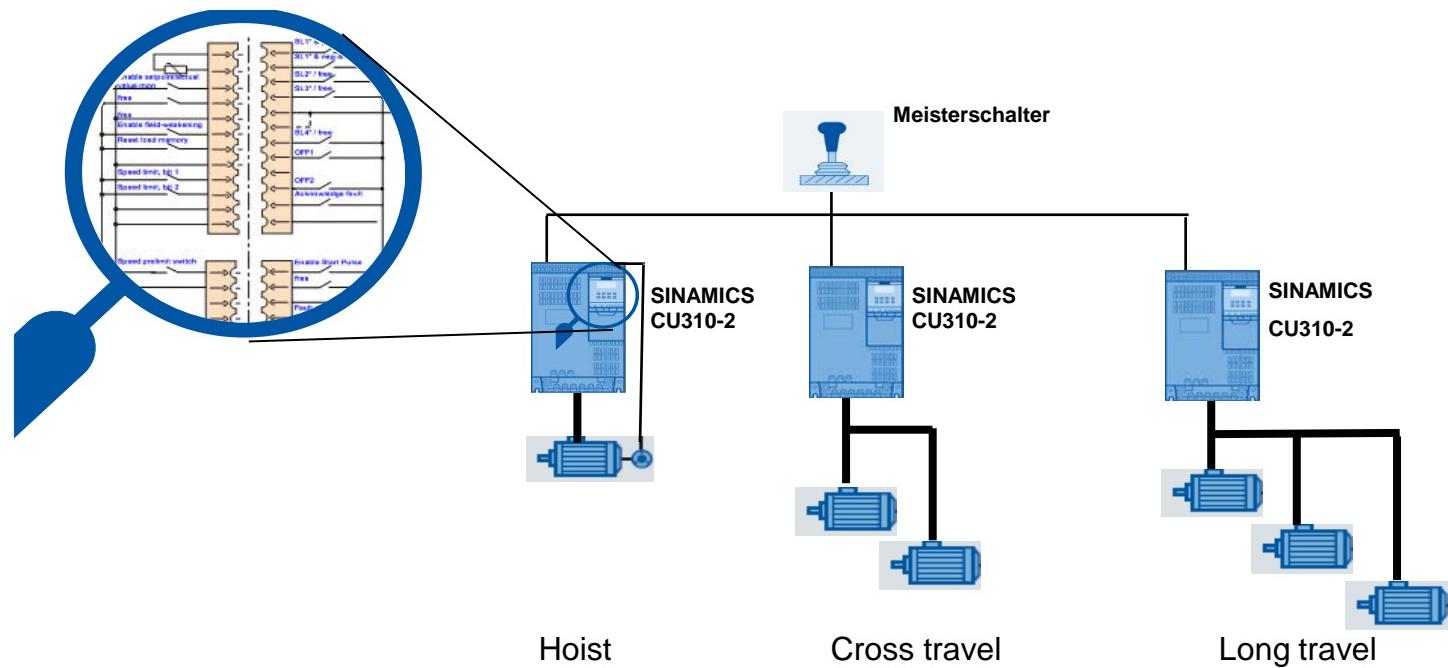
- SINAMICS FW V4.5.1 for Cranes

CD with

- Cranes DCC blocks
- Standard applications
- Documentation

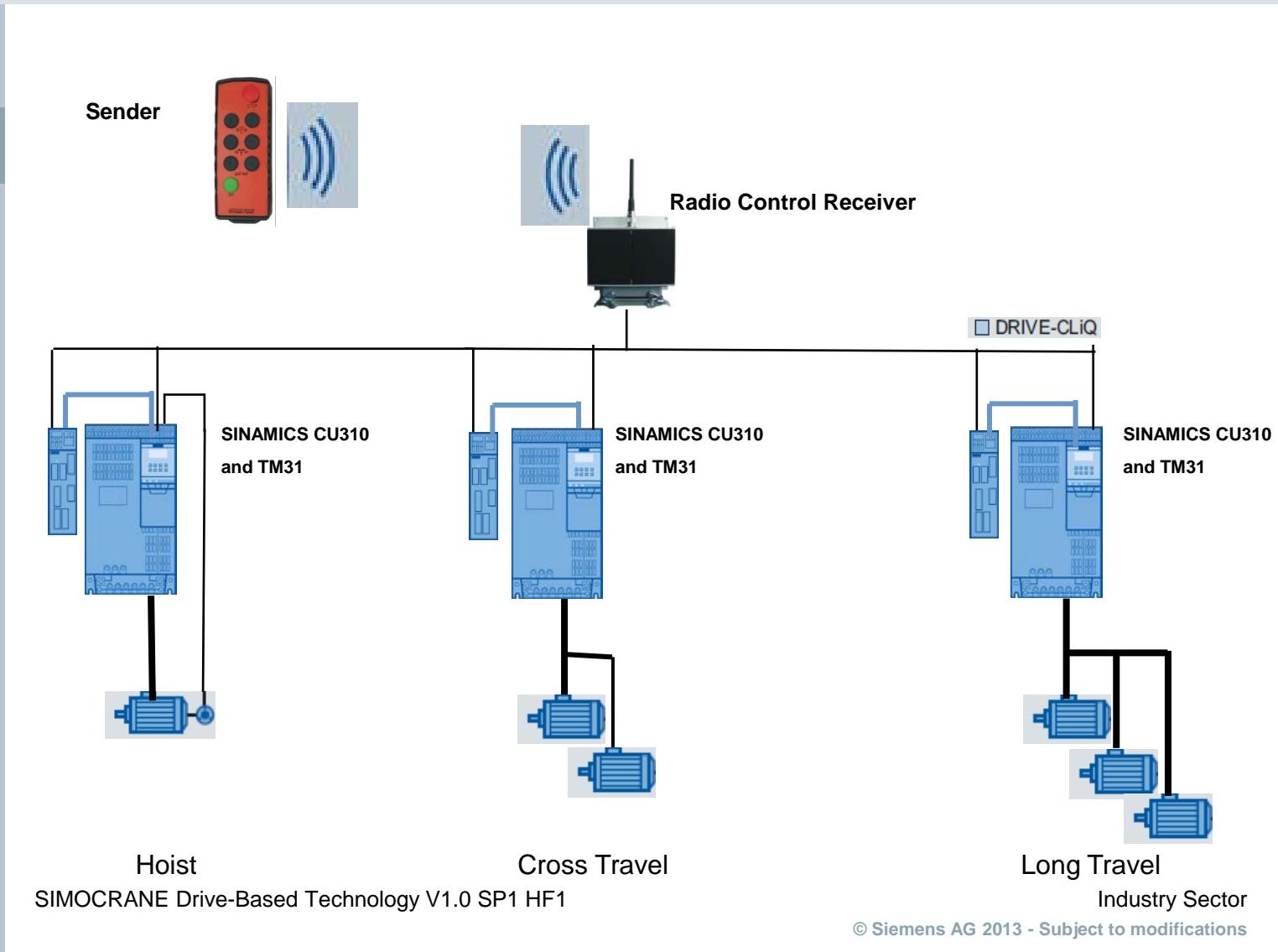
Configuration Example of OHBC with Onboard I/O-signal

Product Scope



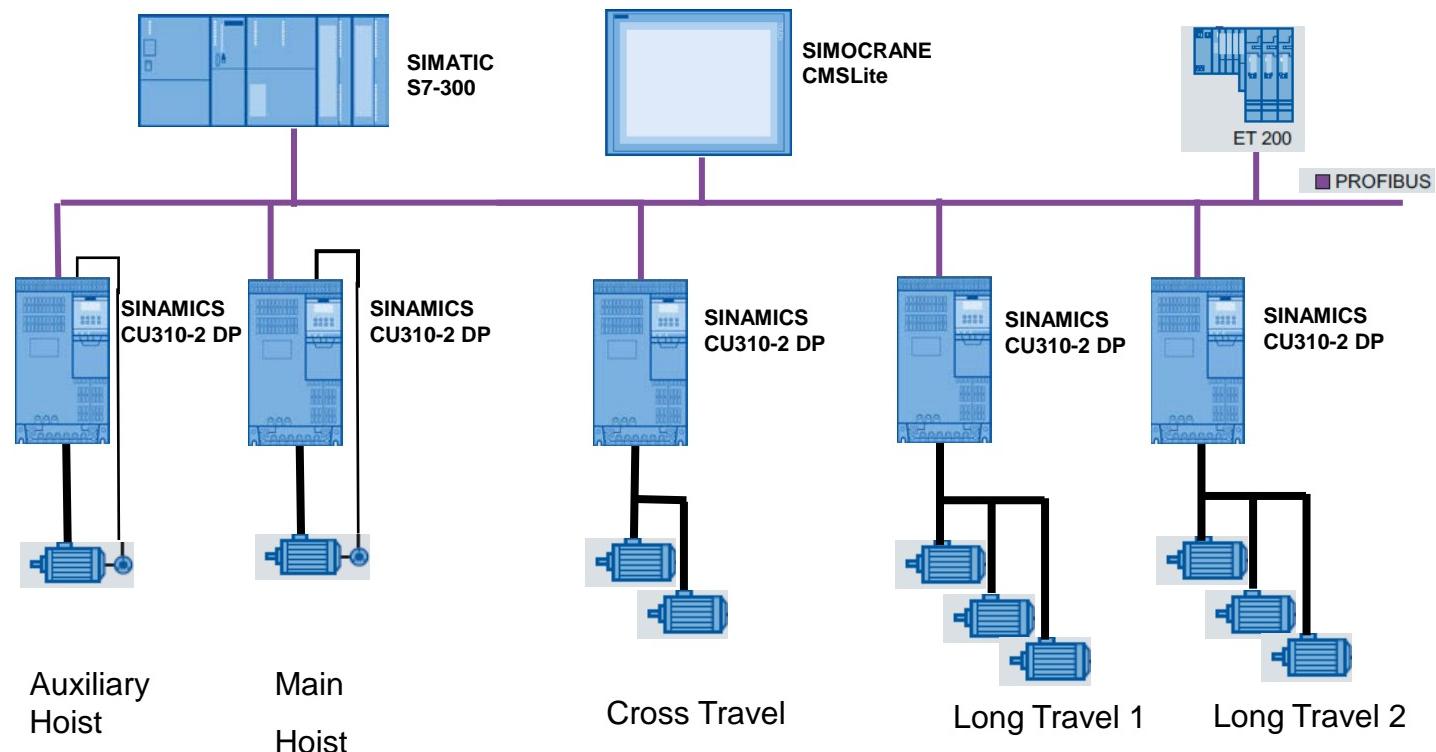
Configuration Example of OHBC with I/O Terminal Board Control

Product Scope



Configuration Example of OHBC with Simatic Control via Profibus

Product Scope



Commissioning Guideline

Commissioning Guideline



Sinamics
Getting Started



Adobe Acrobat
Document

Commissioning
Guideline

1. Import project of SIMOCRANE Drive-Based Technology



2. Configuration of Drive object

Sinamics

3. Running Script



4. Motor identification (Sinamics Getting Started)

Sinamics

5. Parameterization of Crane DCC-blocks



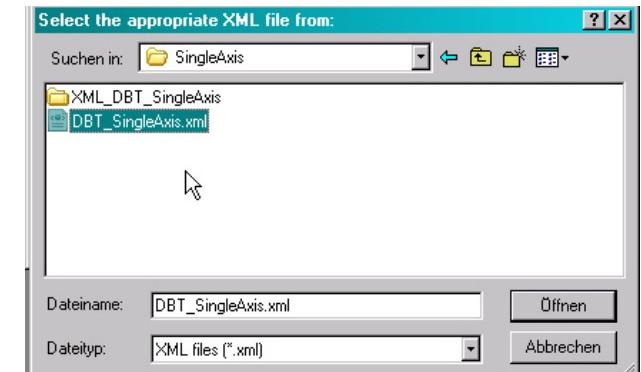
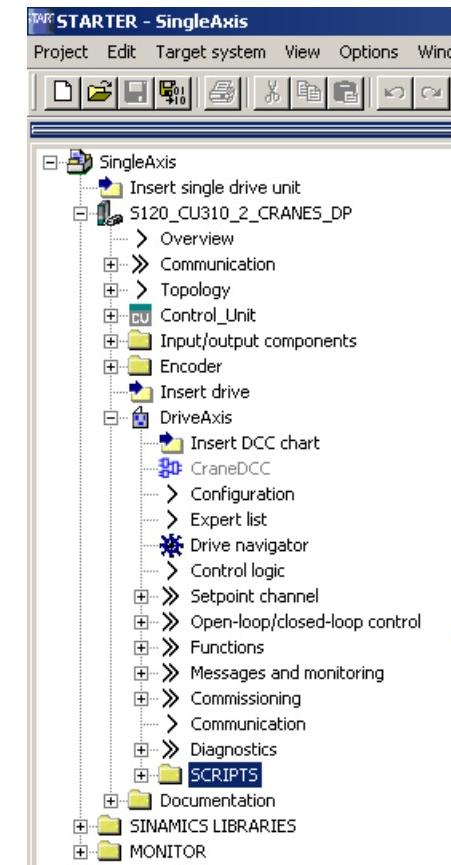
Refer to the manual “Sinamics Getting Started” and

“SIMOCRANE Drive-Based Technology”, Chapter 6

SIMOCRANE Drive-Based Technology V1.0 SP1 HF1

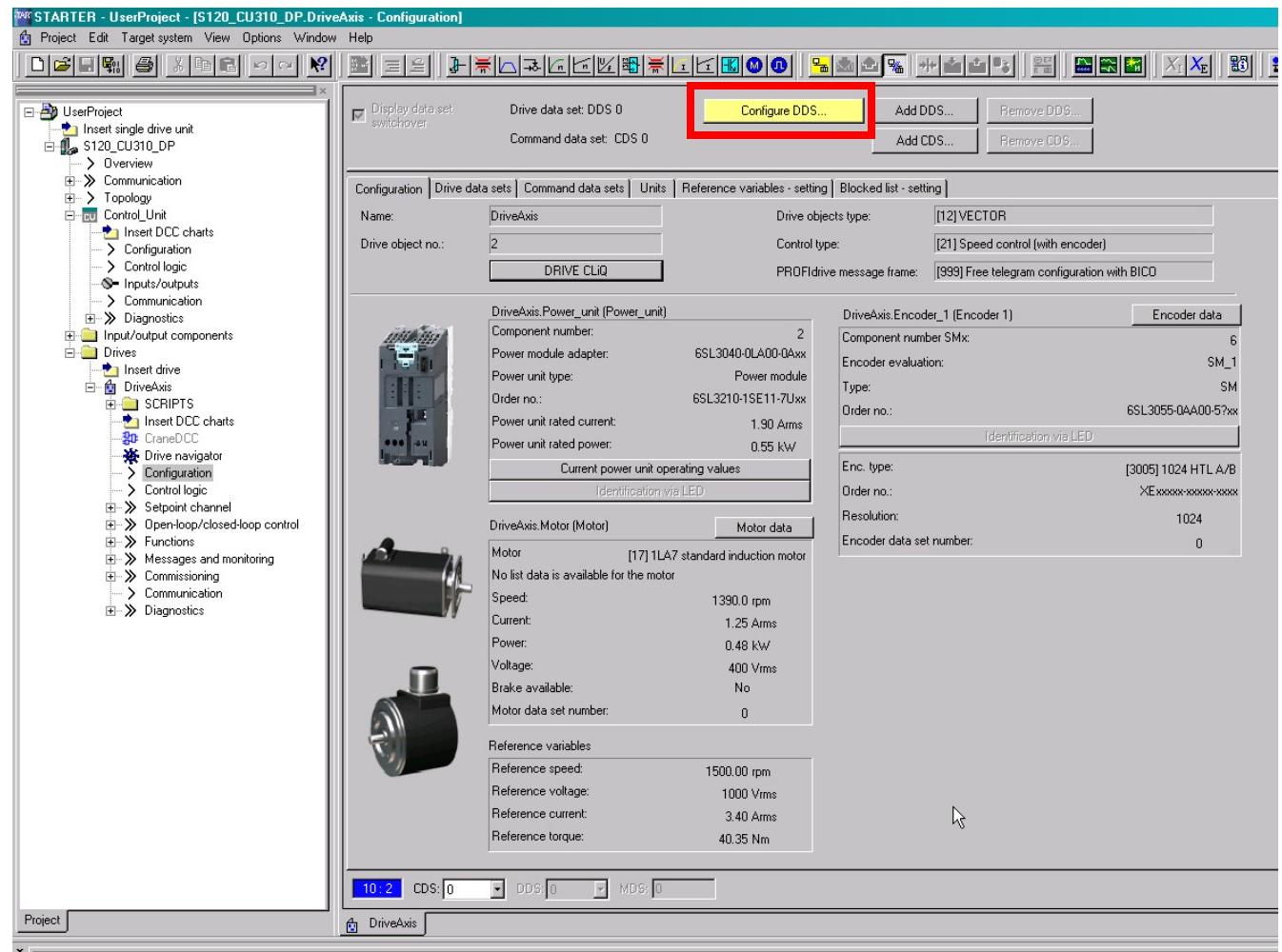
Import project with the IMPORT function

1. Start the engineering tool STARTER
2. Actual project must be closed, then import the project



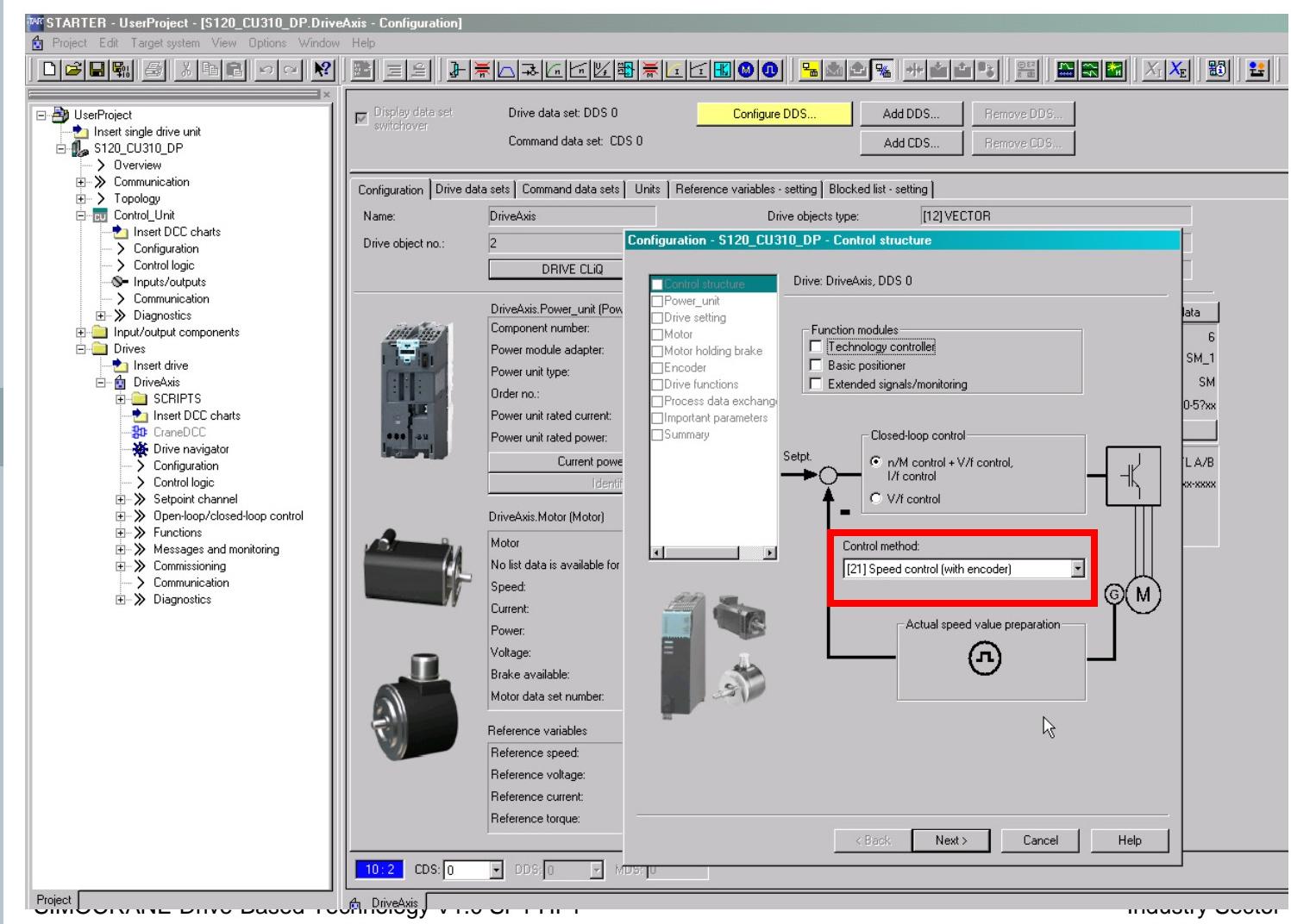
Configuration of the Drive Object (DO)

Step 2
Configuration DO



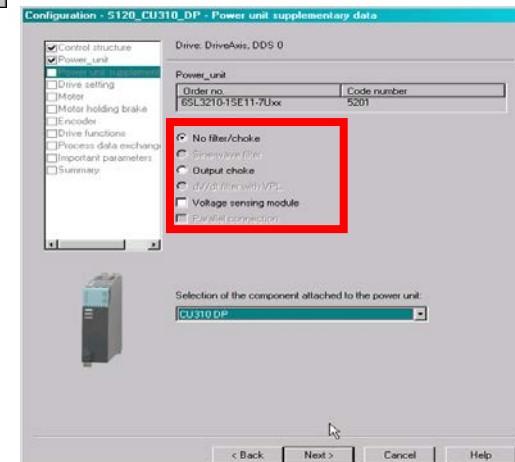
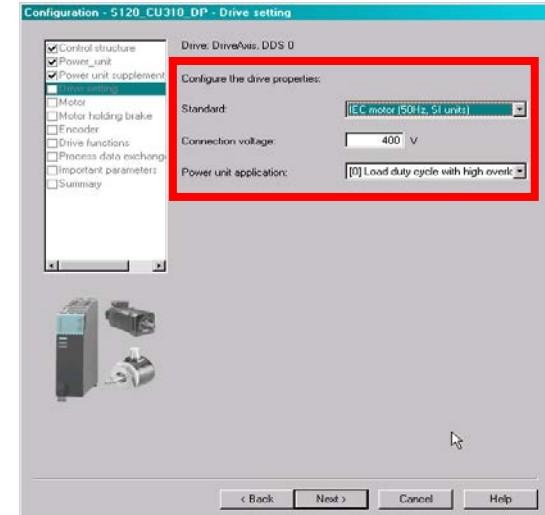
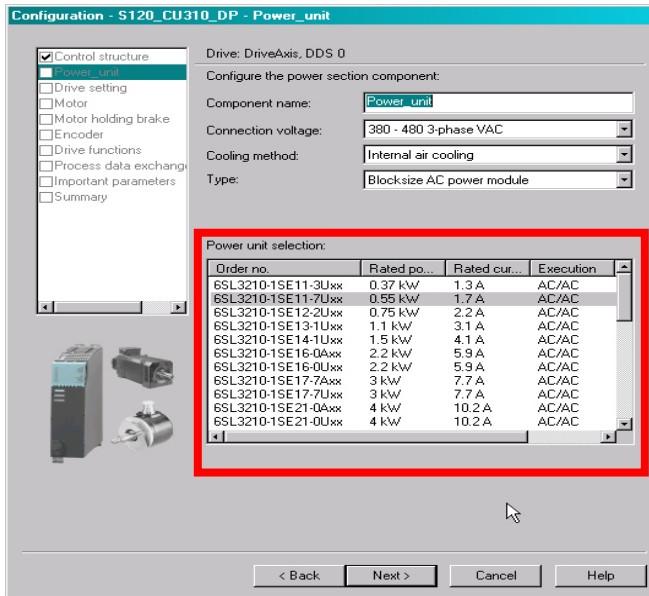
Select control method

Step 2 Configuration DO



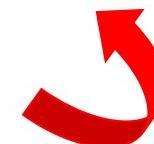
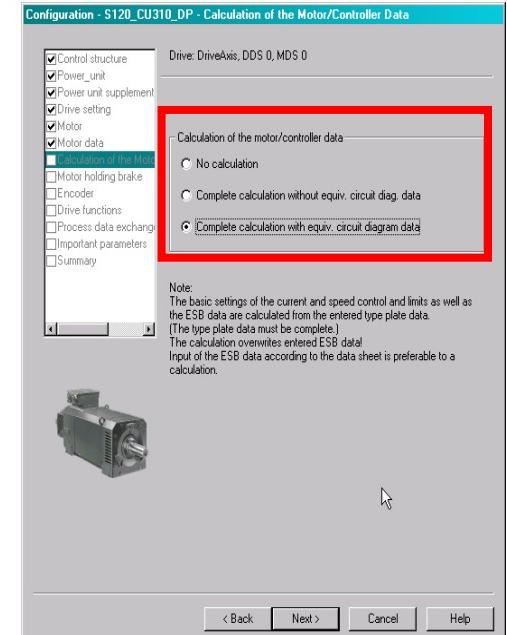
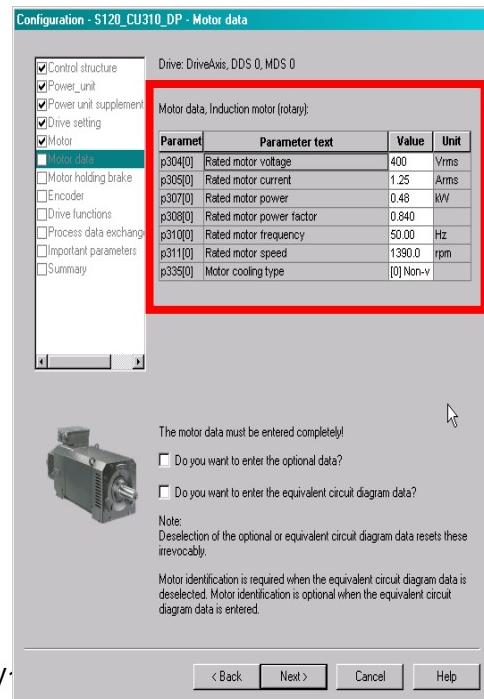
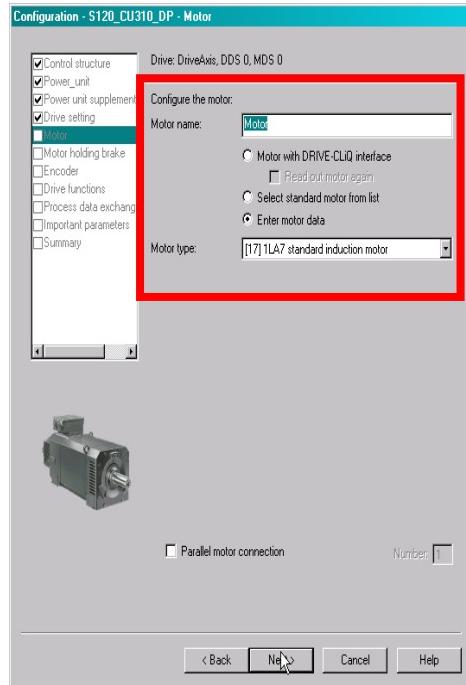
Configuring of the power unit and drive properties

Step 2
Configuration DO



Configuring of motor

Step 2 Configuration DO



Configuring of holding brake and encoder

Step 2 Configuration DO

Configuration - S120 CU310_2_CRANES_DP - Motor holding brake

Drive: DriveAxis, DDS 0

Holding brake configuration:

- [3] Motor holding brake like sequence control, connection via BICO
- Extended brake control

Brake control module type:

- [0] Brake control with diagnostics evaluation



< Back Next > Cancel Help

Configuration - S120 CU310_2_CRANES_DP - Encoder

Drive: DriveAxis, DDS 0, MDS 0

Which encoder do you want to use?

- Encoder 1
- Encoder 2
- Encoder 3

Encoder 1

Encoder evaluation: CU310-2 DP

Encoder name: Encoder_1

Encoder with DRIVE-CLIQ interface

 Read encoder again

Select standard encoder from list

 Via order no.

Enter data

 Encoder data

Encoder type	Code number
2048, 1 Vpp, A/B, SSI, multiturn 4096, err...	2084
4000 nm, 1 Vpp, A/B R distance-coded	2110
20000 nm, 1 Vpp, A/B R distance-coded	2111
40000 nm, 1 Vpp, A/B R distance-coded	2112
16000 nm, 1 Vpp, A/B, EnDat, resolution ...	2151
1024 HTL A/B R	3001
1024 TTL A/B R	3002
2048 HTL A/B R	3003
1024 HTL A/B	3005
1024 TTL A/B	3006

Details

< Back Next > Cancel Help

Select drive functions, communication frame type ..

Step 2 Configuration DO

The image displays three configuration screens from the SIMOCRANE software:

- Configuration - S120 CU310 DP - Drive functions**: Shows the "Drive: DriveAxis, DDS 0" configuration. A red box highlights the "Technological application" dropdown set to "Standard drive (VECTOH)" and the "Motor identification" dropdown set to "Inhibited".
- Configuration - S120 CU310 DP - Important parameters**: Shows the "Drive: DriveAxis, DDS 0" configuration. A red box highlights the "Important parameters" section, which includes fields for Current limit (2.00 Arms), Minimum speed (0.000 rpm), Maximum speed (1500.000 rpm), Ramp-up time (5.000 s), Ramp-down time (5.000 s), and Ramp-down time with OFF3 (3.000 s).
- Configuration - S120 CU310 DP - Process data exchange (drive)**: Shows the "Drive: DriveAxis, DDS 0" configuration. A red box highlights the "Select the PROFinet message frame type" dropdown set to "Free telegram configuration with BICO". It also shows fields for Input data / actual values (Length: 0) and Output data / setpoints (Length: 0). Notes at the bottom mention BICO parameter interconnection and interface-specific settings.

Summary

Step 2 Configuration DO

Configuration - S120 CU310 DP - Summary

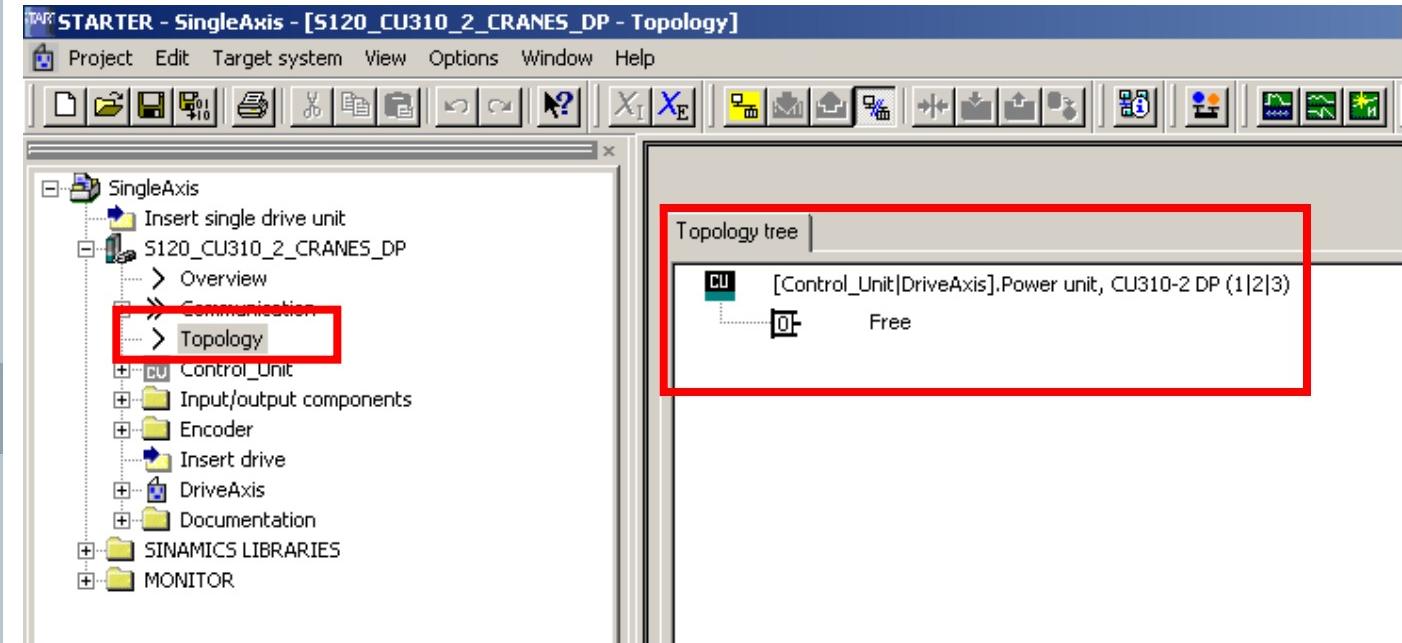
The following data of the drive has been entered:

Control structure
 Power_unit
 Power unit supplement
 Drive setting
 Motor
 Motor data
 Calculation of the Motor
 Motor holding brake
 Encoder
 Drive functions
 Process data exchange
 Important parameters
 Summary



Control structure:
Control type: [21] Speed control (with encoder)
Power unit component:
Component name: Power_unit
Component type: AC-Power Module
Order no.: 6SL3210-1SE11-7Uxx
Rated power: 0.55 kW
Rated current: 1.7 A
Power unit supplementary data:
No filter/choke
Adapter module: CU310 DP
Drive setting:
Standard: IEC motor (50Hz, SI units)
Connection voltage: 400 V
Power unit application: [0] Load duty cycle with high overload for vector drives
Motor:
Motor name: Motor
Motor type: [17] 1LA7 standard induction motor
Motor data:
p304[0]: Rated motor voltage 400 Vrms
p305[0]: Rated motor current 1.25 Arms
p307[0]: Rated motor power 0.48 kW
p308[0]: Rated motor power factor 0.840
p310[0]: Rated motor frequency 50.00 Hz
p311[0]: Rated motor speed 1390.0 rpm
p335[0]: Motor cooling type [0] Non-ventilated
Calculation of the Motor/Controller Data:
Complete calculation with equiv. circuit diagram data
Motor holding brake:
Motor holding brake: Not available

Check Topology

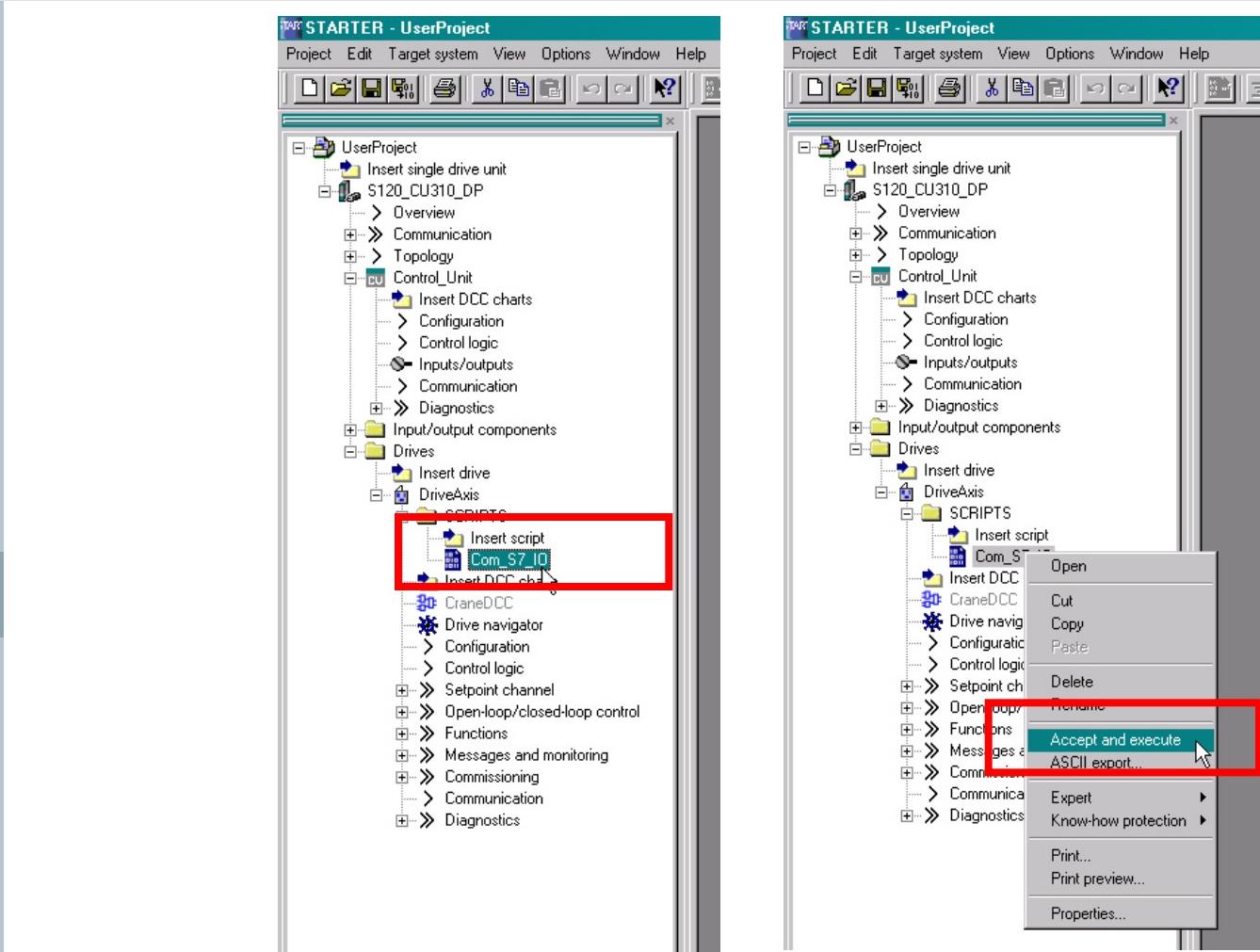


Step 2
Configuration DO

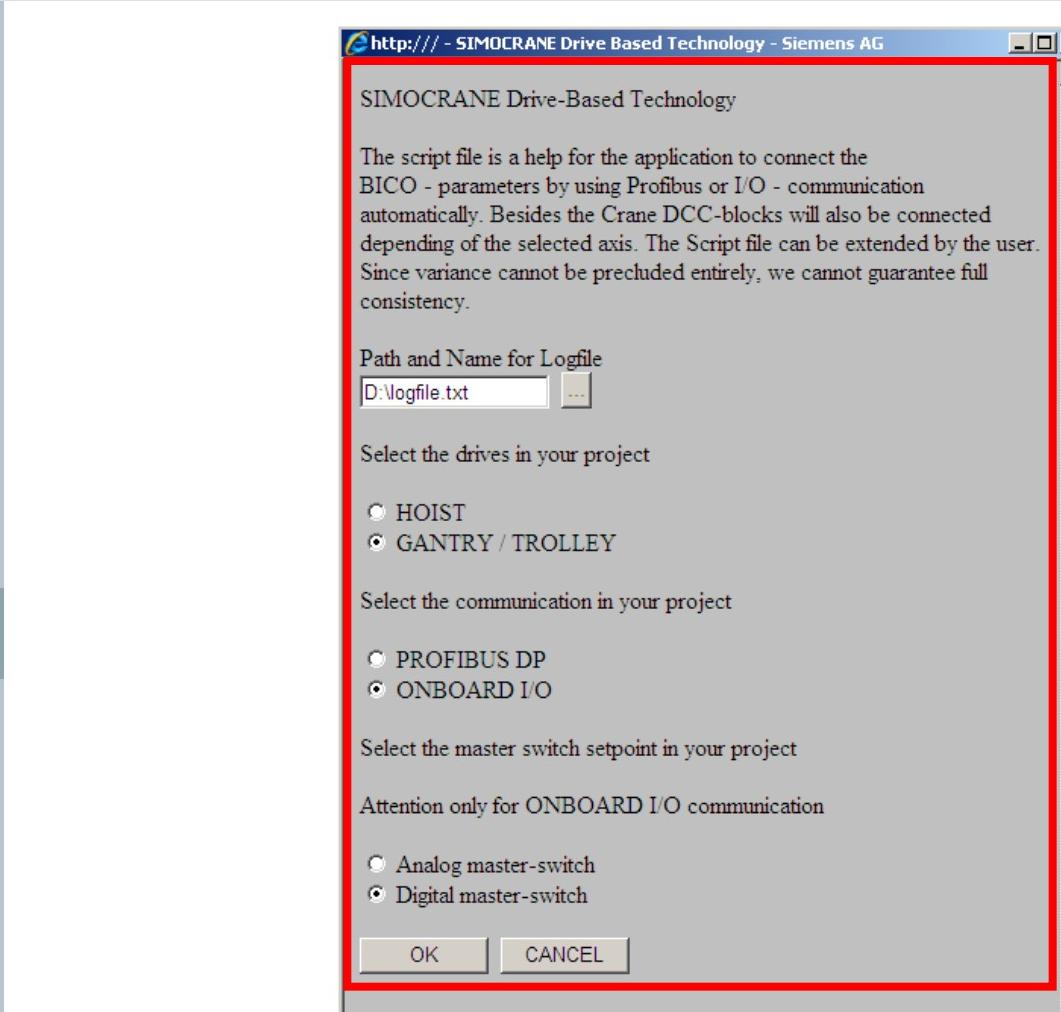


Execute Script file

Step 3
Running Script

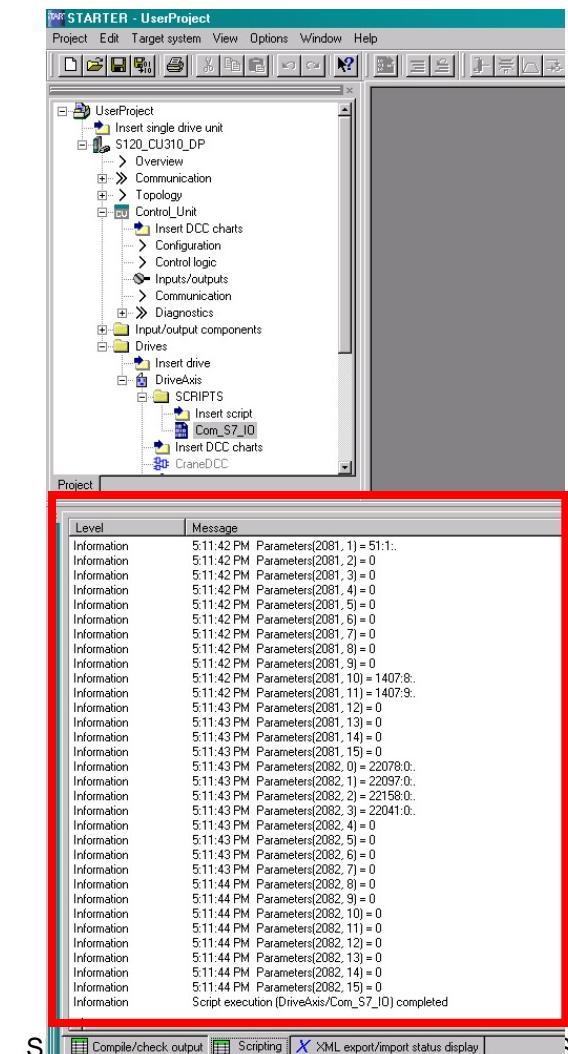


Script file window



Step 3 Running Script

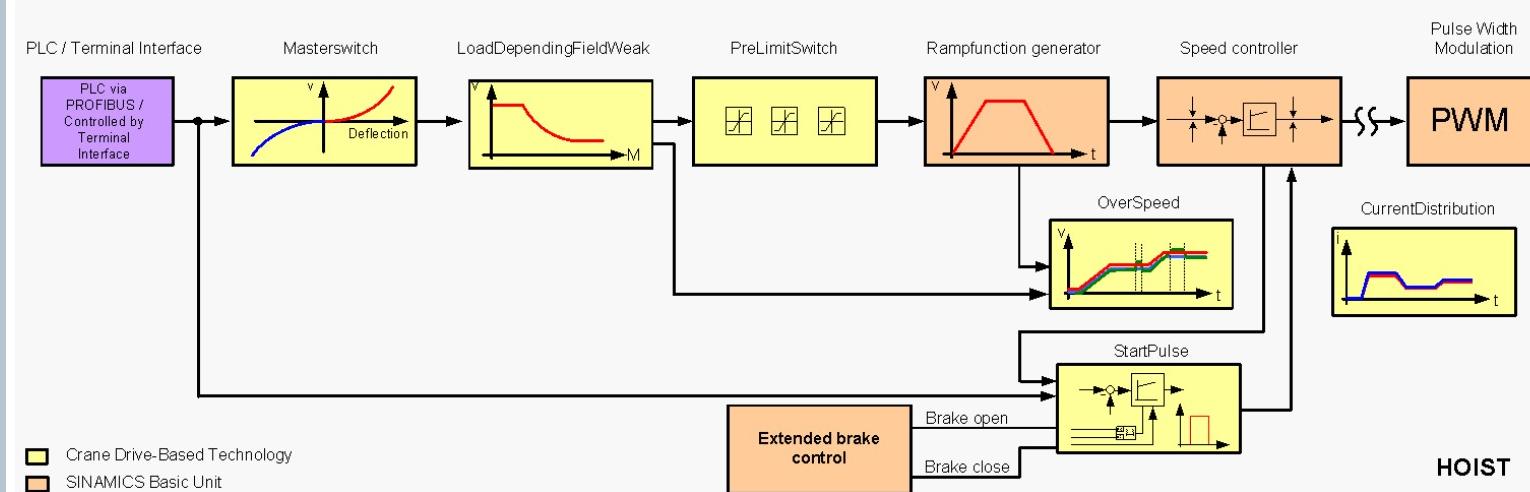
Running script



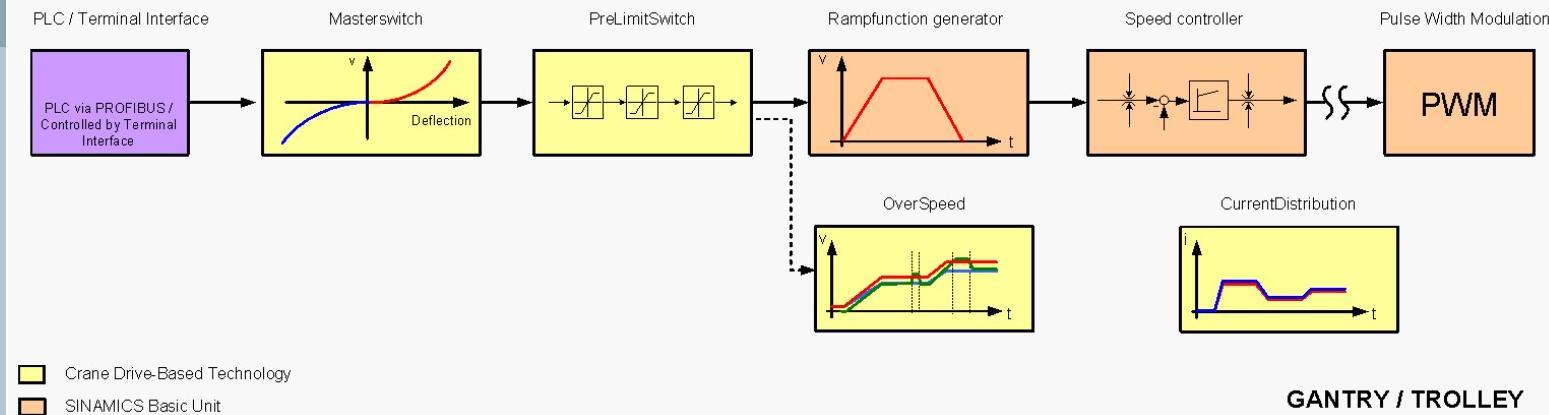
In the script window all parameter settings will be shown.
A log-file can be saved for documentation

Step 3 Running Script

Setpoint channel in CU310-2 after running script (via Profibus control)



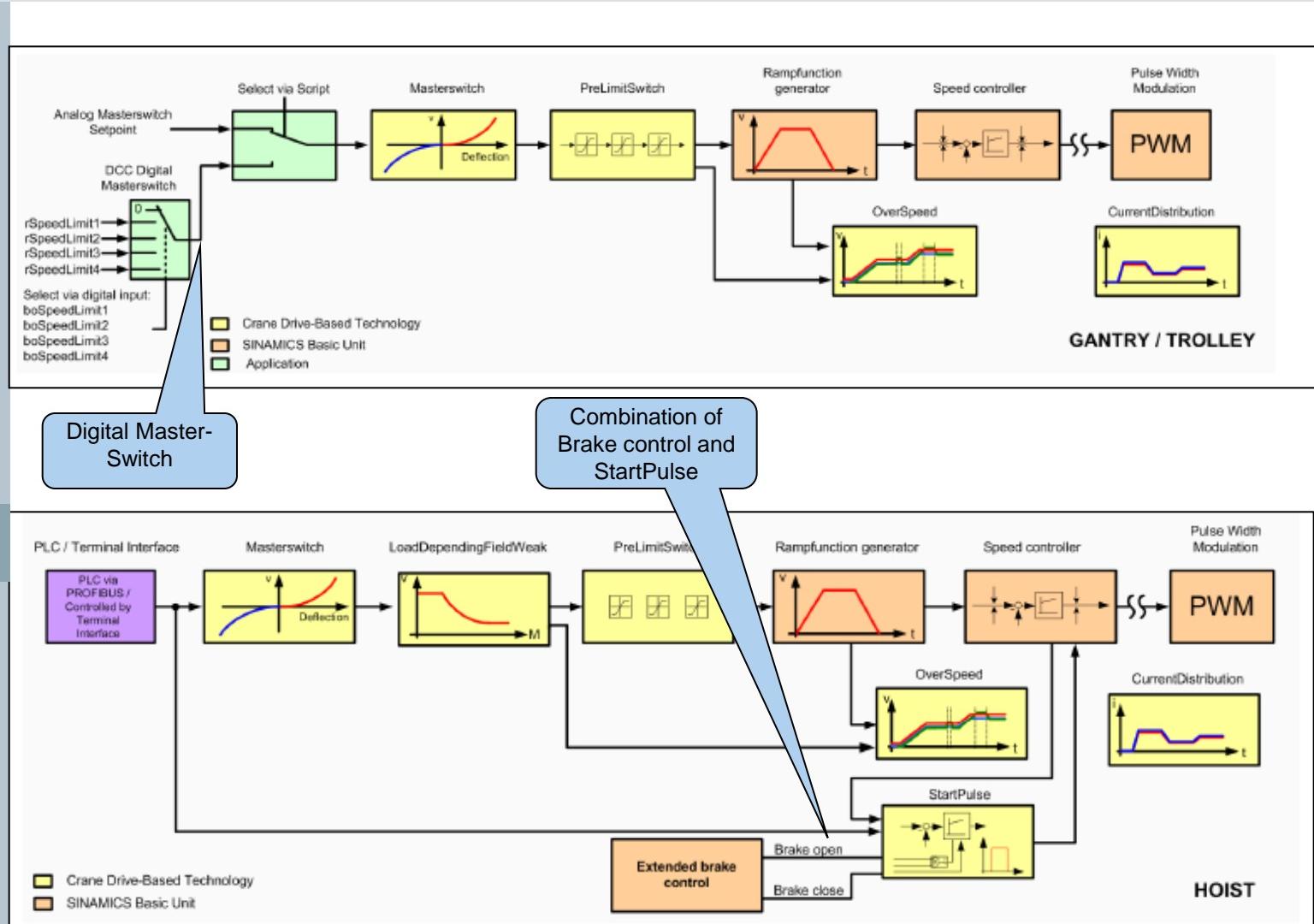
Step 3 Running Script



SIMOCRANE Drive-Based Technology V1.0 SP1 HF1

Industry Sector

Hoist Setpoint channel in CU310-2 after running script (via Onboard I/O with digital masterswitch or Profibus control)

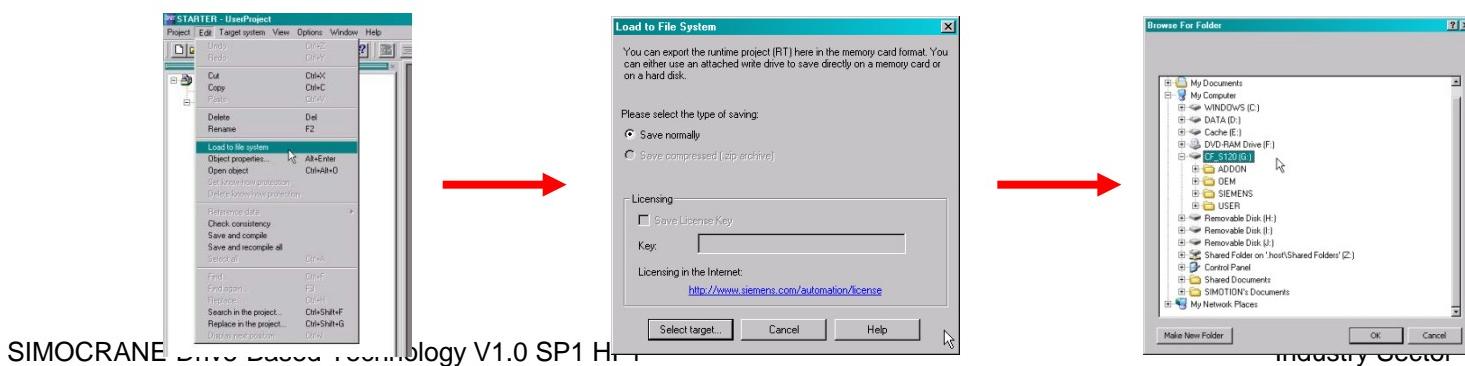


Step 3
Running Script

Download into CF-card

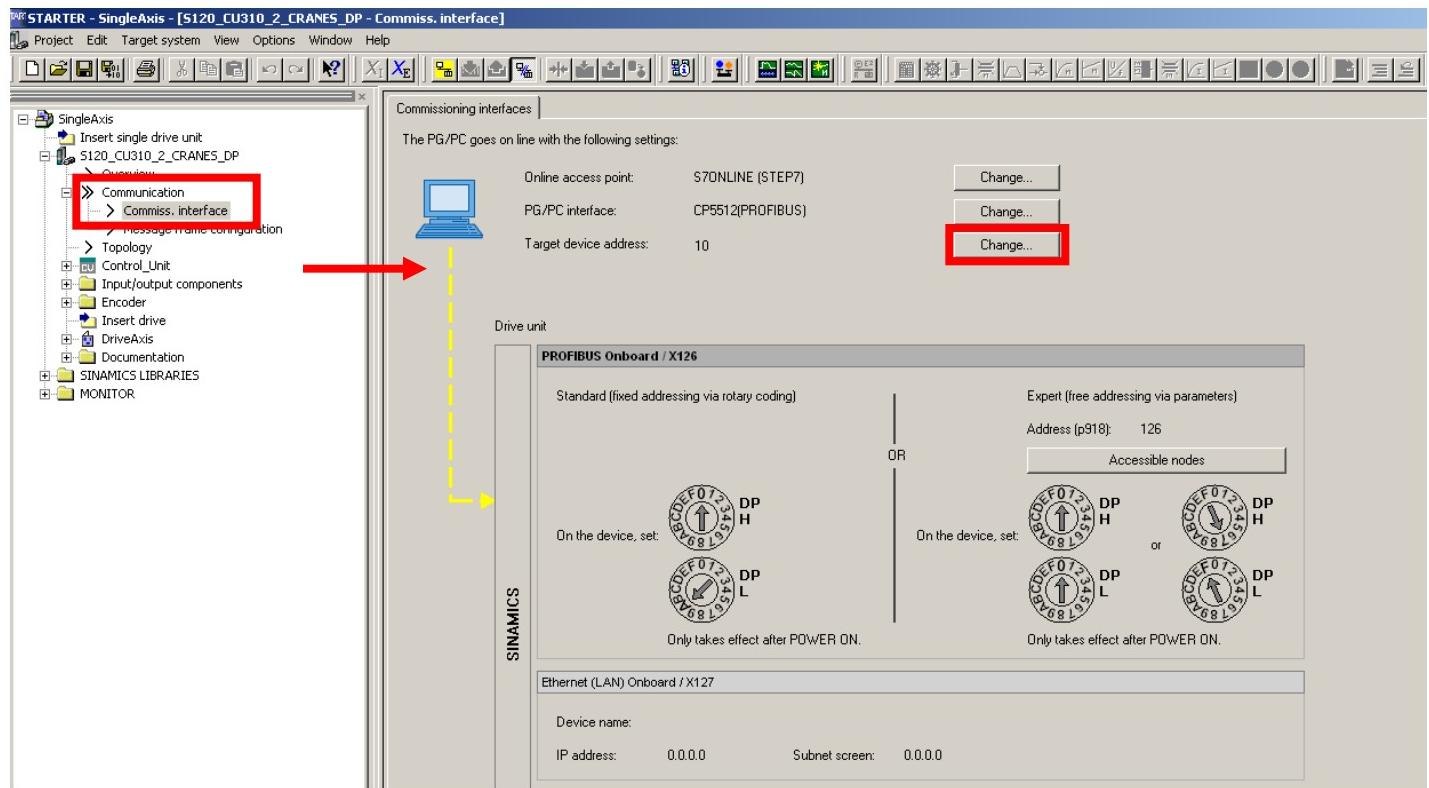
Save and compile the project and then the project can be downloaded in two ways:

1. With STARTER go online via Profibus to SINAMICS CU310-2 and download the project into the device.
2. Put the Compact Flash card into a card reader and download the project direct to the CF card and then put the CF card into the device.



Communication Interface via Profibus

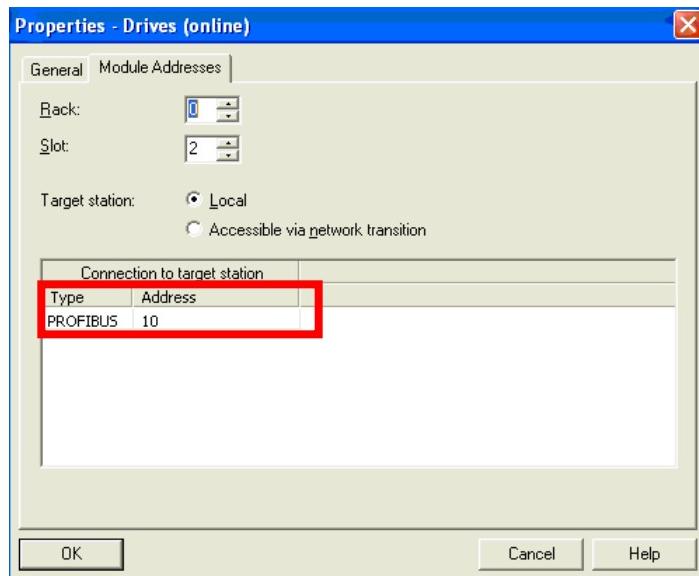
For online download the profibus address must be configured as follows:



Step 4 Motor identification

Communication Interface via Profibus

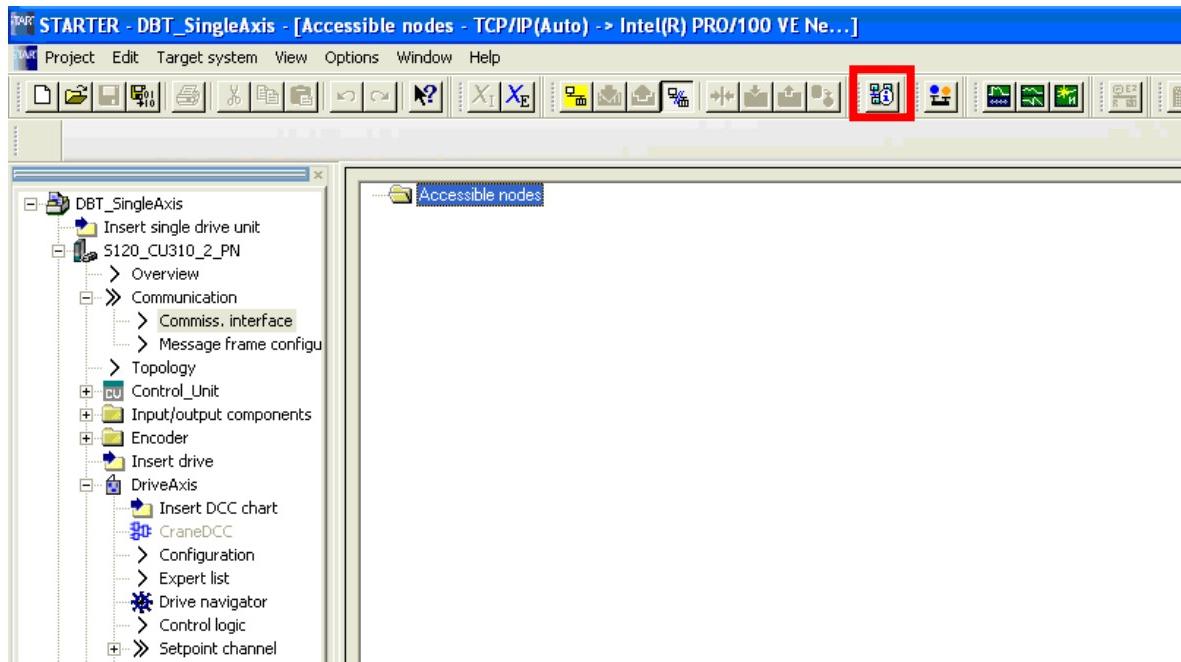
- The profibus address is entered here. (This must correspond to the profibus address found on the CU310-2)



- The profibus address can be set on the CU310-2 by setting the switches found underneath the BOP.

Communication interface via Ethernet (1)

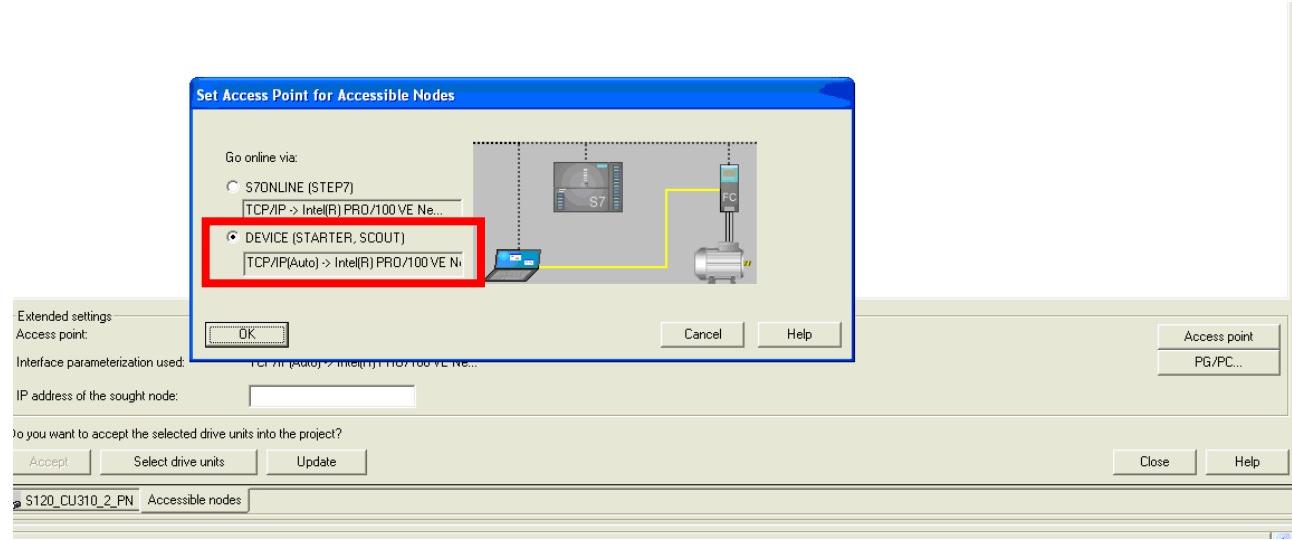
- For using an Ethernet connection to connect to the control unit select the accessible nodes button to find device.



Step 4
Motor identification

Communication interface via Ethernet (2)

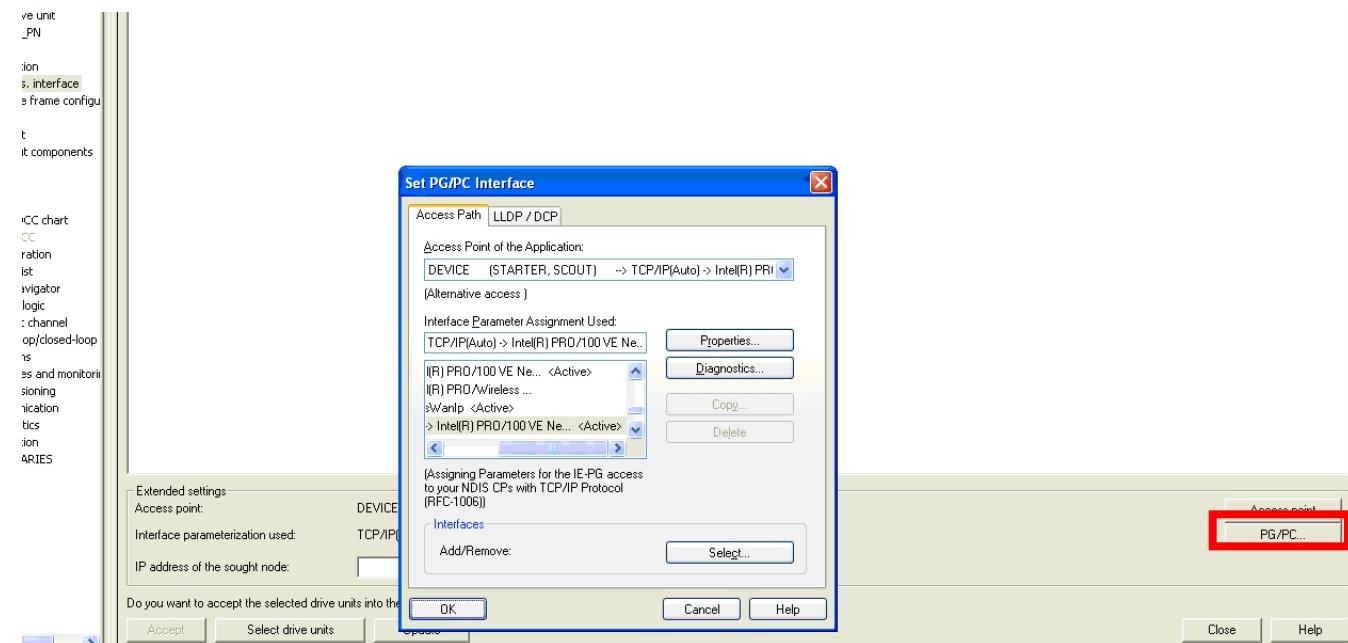
- If the device is not found immediately:
 1. Set access point to device in the accessible nodes tab.



Step 4 Motor identification

Communication interface via Ethernet (3)

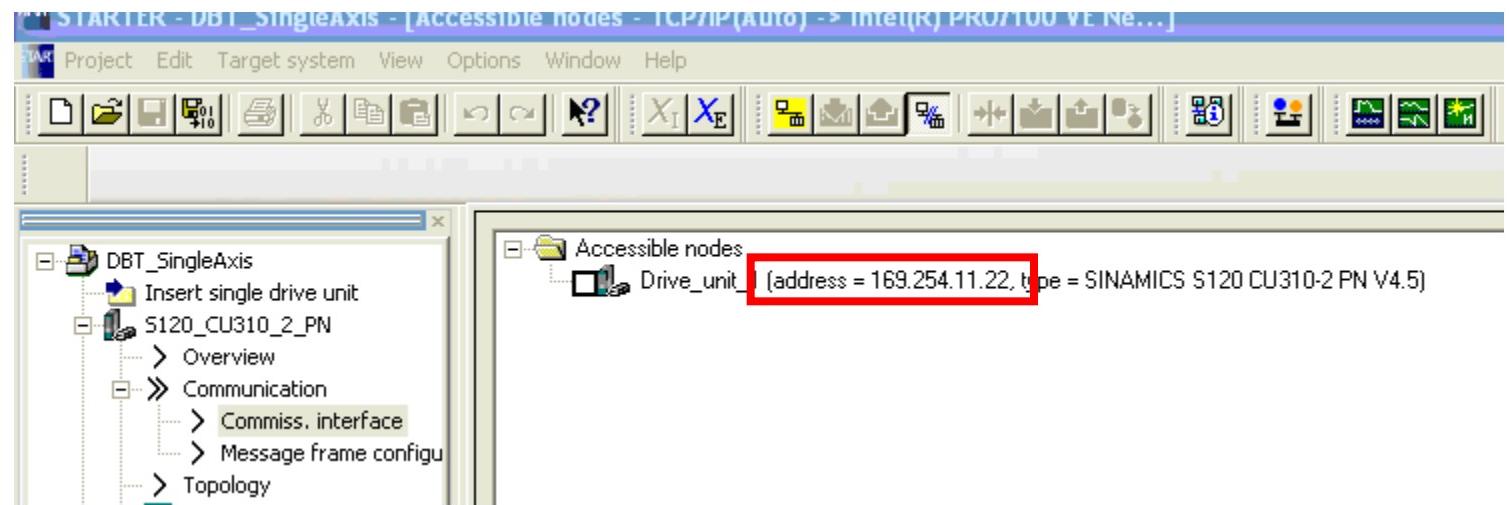
- Set the PG/PC interface in the accessible nodes tab. (Tip: Select component which has <Active> written after it).



Step 4 Motor identification

Communication interface via Ethernet (4)

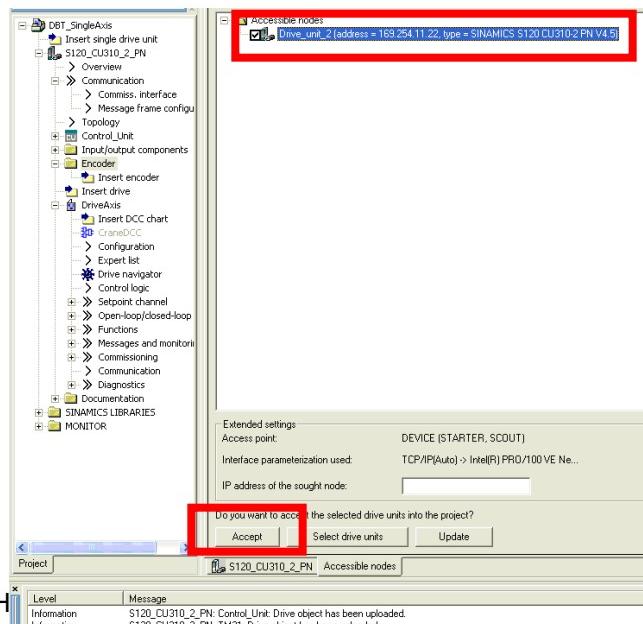
3. Select search for accessible nodes again.
4. When the device is found note the IP address.



Step 4
Motor identification

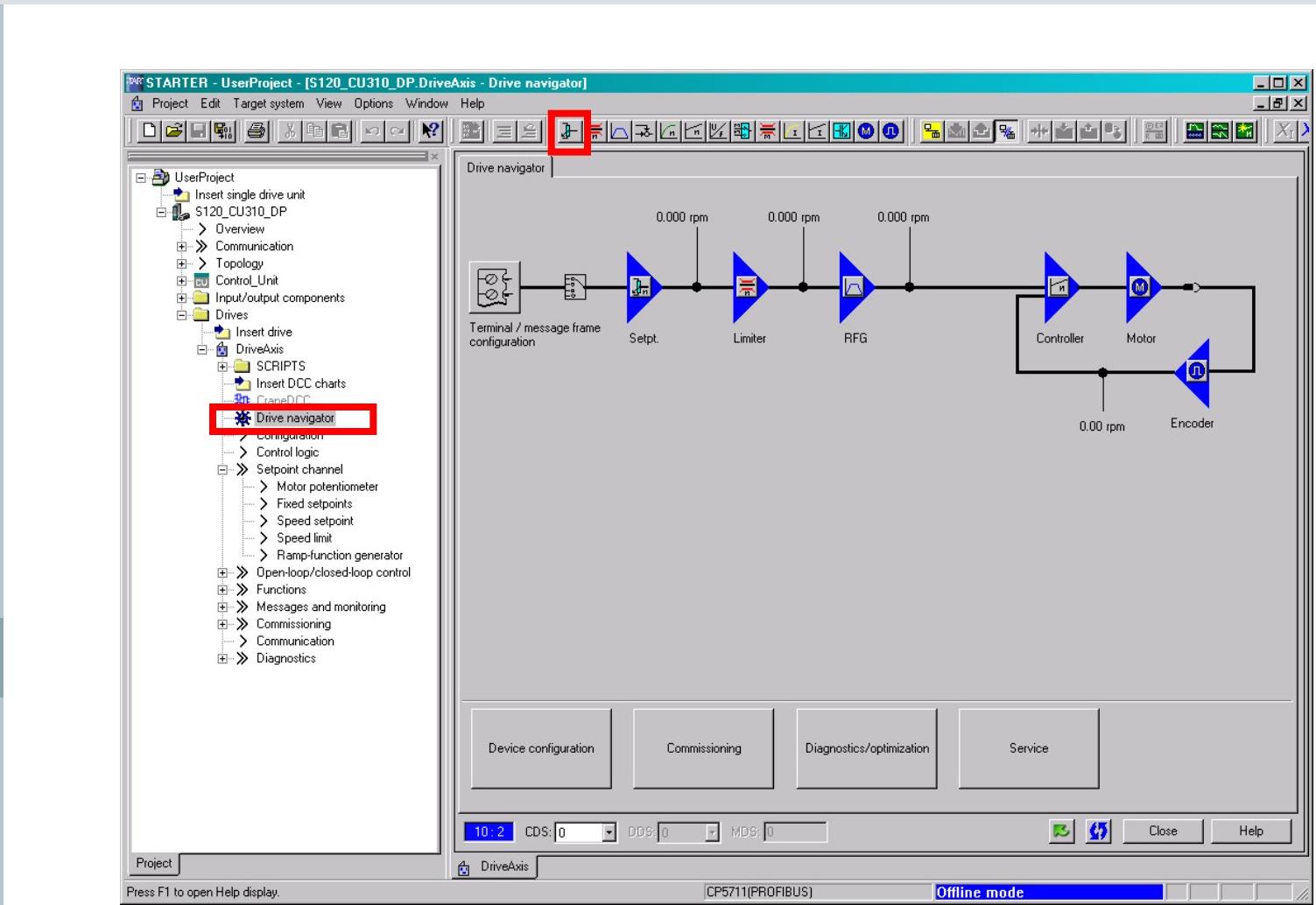
Communication interface via Ethernet (5)

5. Adjust the PG/PC IP address so that it will have the same first 3 numbers as the address of the device but with a different fourth number. (E. g. If the device address is 169.254.11.22 then the PC/PG address should be changed accordingly to an address with the same first 3 numbers but a different fourth e. g. 169.254.11.1)
6. Highlight device in accessible nodes tab and accept device into project.



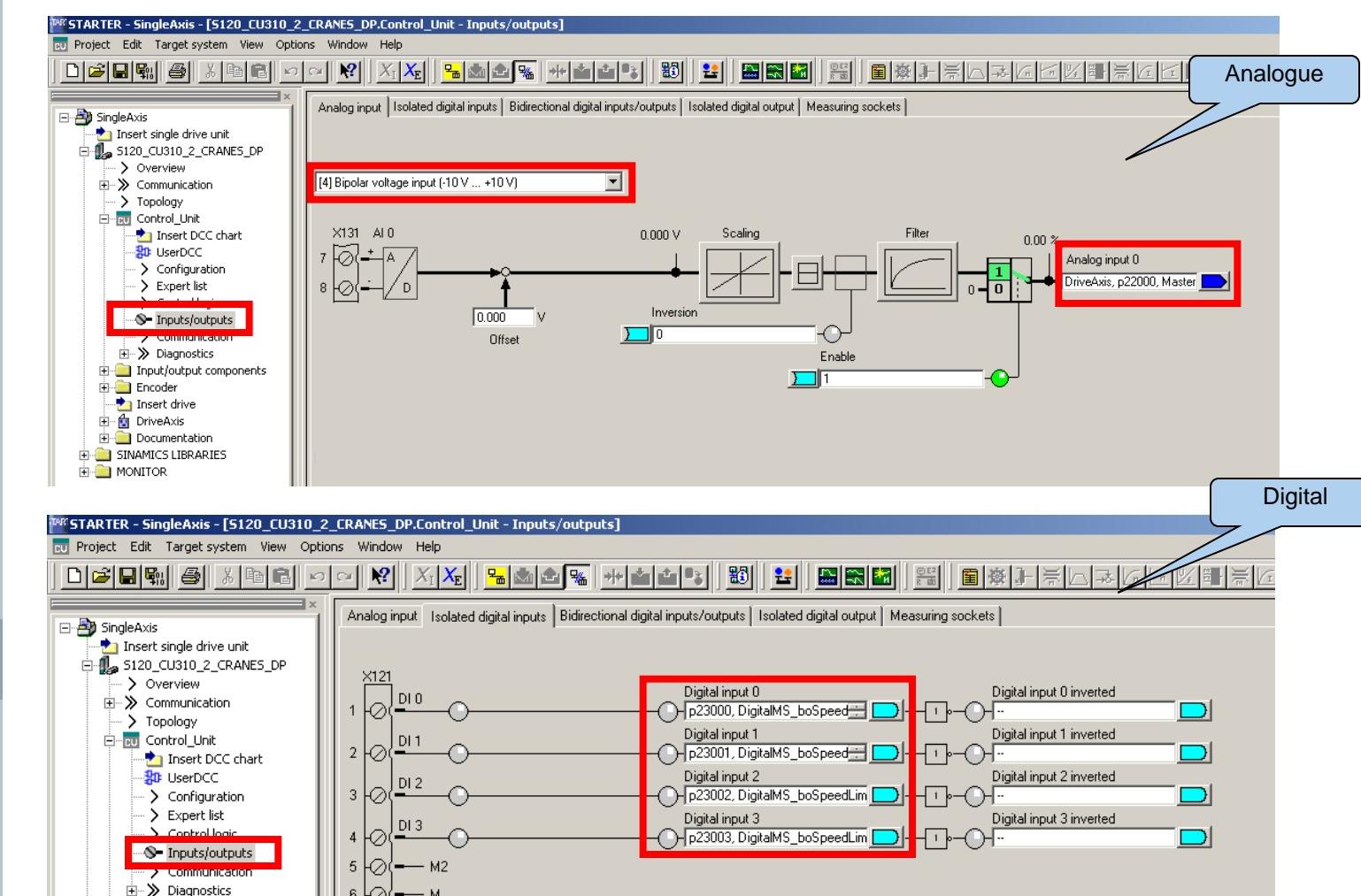
Step 4 Motor identification

Overview of drive navigator



Step 4 Motor identification

Overview of I/O-Signals



Step 4 Motor identification

Overview of parameter list

STARTER - SingleAxis - [S120 CU310_2 CRANES_DP.DriveAxis - Expert list]

Project Edit Target system View Options Window Help

SingleAxis

- Insert single drive unit
 - S120 CU310_2 CRANES_DP
 - Overview
 - Communication
 - Topology
 - Control Unit
 - Input/output components
 - Encoder
 - Insert drive
 - DriveAxis
 - Insert DCC chart
 - CraneDCC
 - Configuration
 - Expert list
 - Drive navigator
 - Control logic
 - Setpoint channel
 - Open-loop/closed-loop control
 - Functions
 - Messages and monitoring
 - Commissioning
 - Communication
 - Diagnostics
 - SCRIPTS
- Documentation
- SINAMICS LIBRARIES
- MONITOR

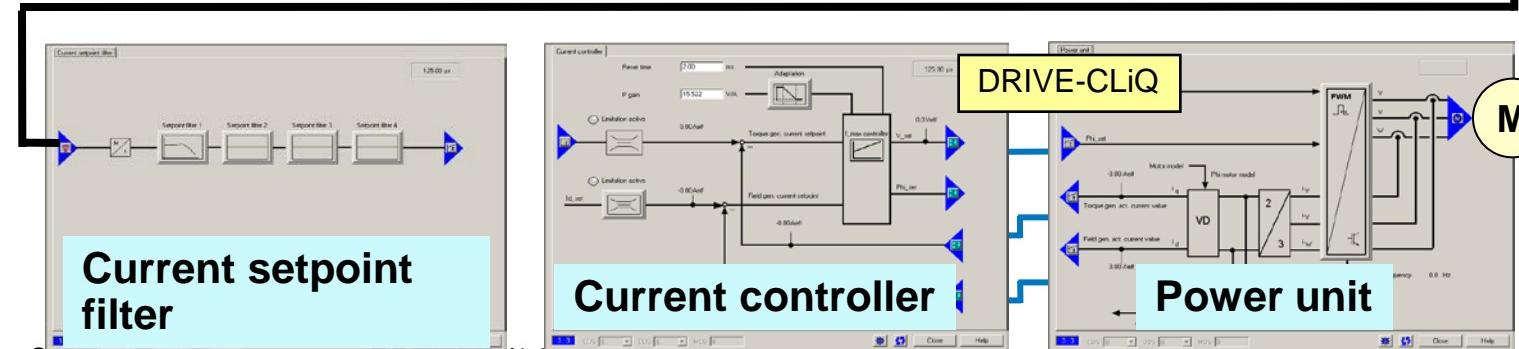
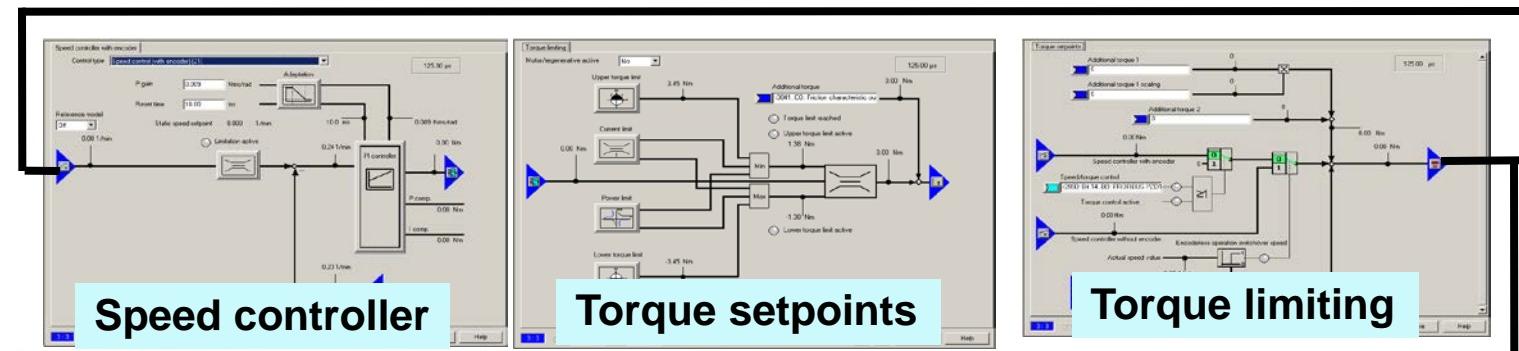
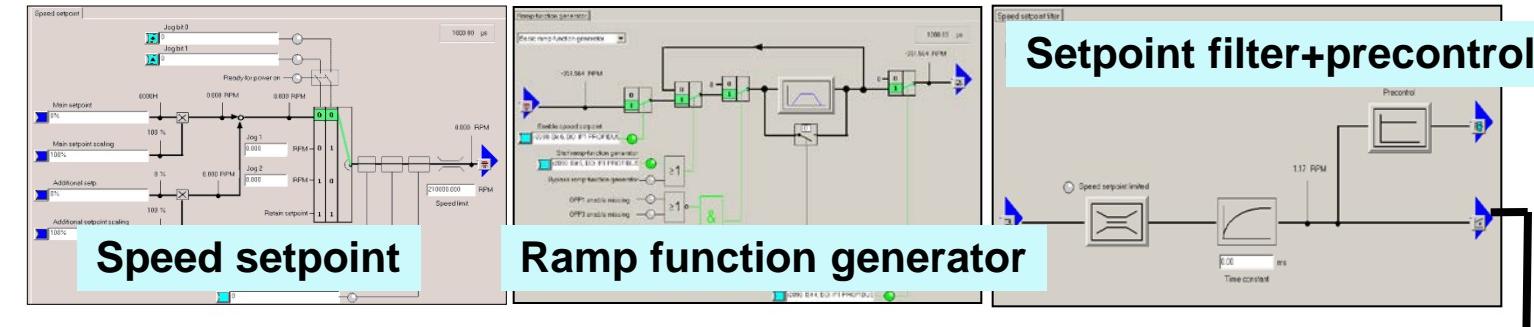
Enter search text

Expert list

Param...	Data	Parameter text	Offline value DriveAxis	Unit
1339	r21005[0]	Computing time load of the run-time group, Run-time group 1	0.0	%
1340	r21008[0]	Hardware sampling times available, Hardware 1	0.050	ns
1341	p22000	MasterSwitch_rInSpeedSetpointMS [%]	Control_Unit : r755[0]	
1342	p22001	MasterSwitch_boEnableMasterSwitch	0	
1343	p22002	MasterSwitch_boPositiveDeflection	Control_Unit : r722.0	
1344	p22003	MasterSwitch_boNegativeDeflection	Control_Unit : r722.1	
1345	p22004	MasterSwitch_rX1DeflectionParameter [%]	5.000	
1346	p22005	MasterSwitch_rY1SpeedParameter [%]	5.000	
1347	p22006	MasterSwitch_rX2DeflectionParameter [%]	10.000	
1348	p22007	MasterSwitch_rY2SpeedParameter [%]	10.000	
1349	p22008	MasterSwitch_rX3DeflectionParameter [%]	25.000	
1350	p22009	MasterSwitch_rY3SpeedParameter [%]	25.000	
1351	p22010	MasterSwitch_rX4DeflectionParameter [%]	50.000	
1352	p22011	MasterSwitch_rY4SpeedParameter [%]	50.000	
1353	p22012	MasterSwitch_rX5DeflectionParameter [%]	75.000	
1354	p22013	MasterSwitch_rY5SpeedParameter [%]	75.000	
1355	p22014	MasterSwitch_rX6DeflectionParameter [%]	100.000	
1356	p22015	MasterSwitch_rY6SpeedParameter [%]	100.000	
1357	r22016	MasterSwitch_rOutSpeedSetpointMS [%]	0.000	
1358	p22030	OverSpeed_rSpeedSetpoint [%]	DriveAxis : r62	
1359	p22031	OverSpeed_rActualSpeed [%]	DriveAxis : r63[0]	
1360	p22032	OverSpeed_rRatedSpeed [rpm]	1500.000	
1361	p22033	OverSpeed_rReferenceSpeed [rpm]	DriveAxis : r2700	
1362	p22034	OverSpeed_rAfterRampOn [%]	DriveAxis : r22159	
1363	p22035	OverSpeed_boEnableFieldWeak	DriveAxis : r22158.0	
1364	p22036	OverSpeed_boResetLoadCurrent	Control_Unit : r722.19	
1365	p22037	OverSpeed_boReset	DriveAxis : r2138.7	
1366	p22038	OverSpeed_boEnableSetpointActualMonitoring	Control_Unit : r722.13	
1367	p22039	OverSpeed_rOffset [%]	10.000	
1368	p22040	OverSpeed_rDelayTime [ms]	250.000	
1369	r22041	OverSpeed_boOverspeed	0H	
1370	p22050	PreLimitSwitch_rInSpeedSetpointPLS [%]	DriveAxis : r22156	
1371	p22051	PreLimitSwitch_boBit1LimitSpeed	Control_Unit : r722.20	
1372	p22052	PreLimitSwitch_boBit2LimitSpeed	Control_Unit : r722.21	
1373	p22053	PreLimitSwitch_boPreLimitSwitch	Control_Unit : r722.22	
1374	p22054	PreLimitSwitch_rLimit1 [%]	100.000	

Step 4 Motor identification

Mainstream of speed setpoint and closed-loop control

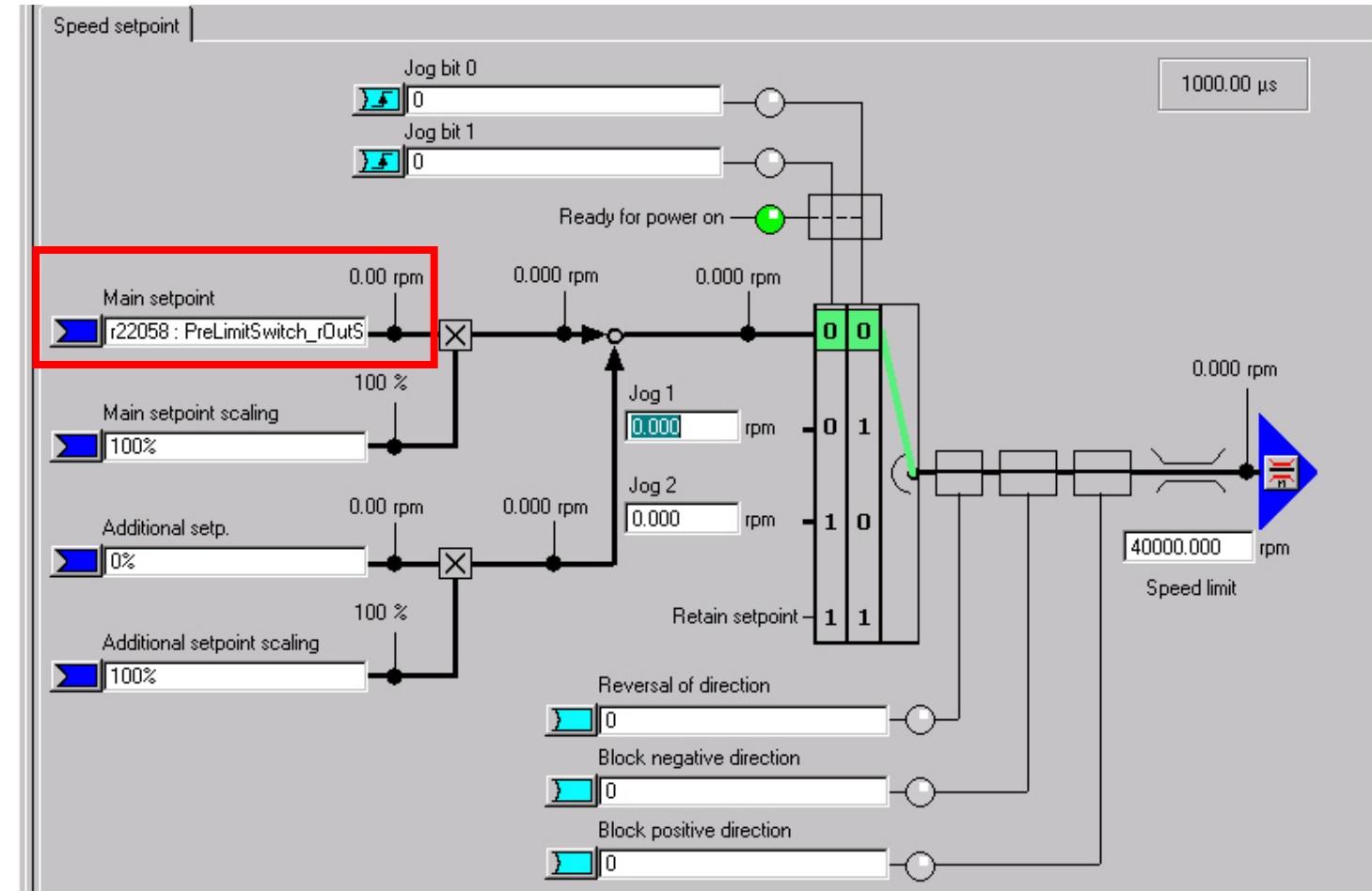


Step 4
Motor identification

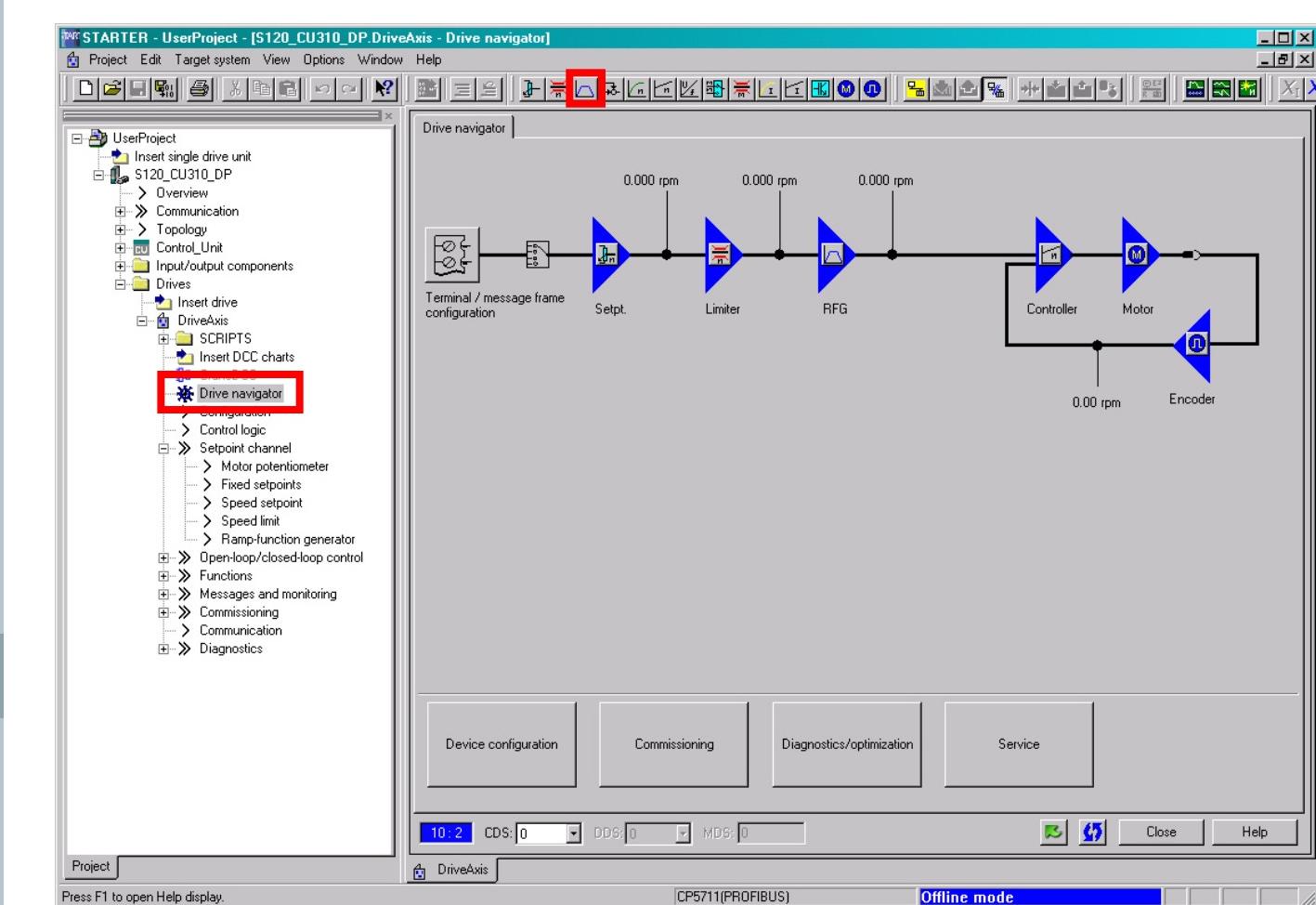
M

Speed setpoint

Step 4
Motor identification

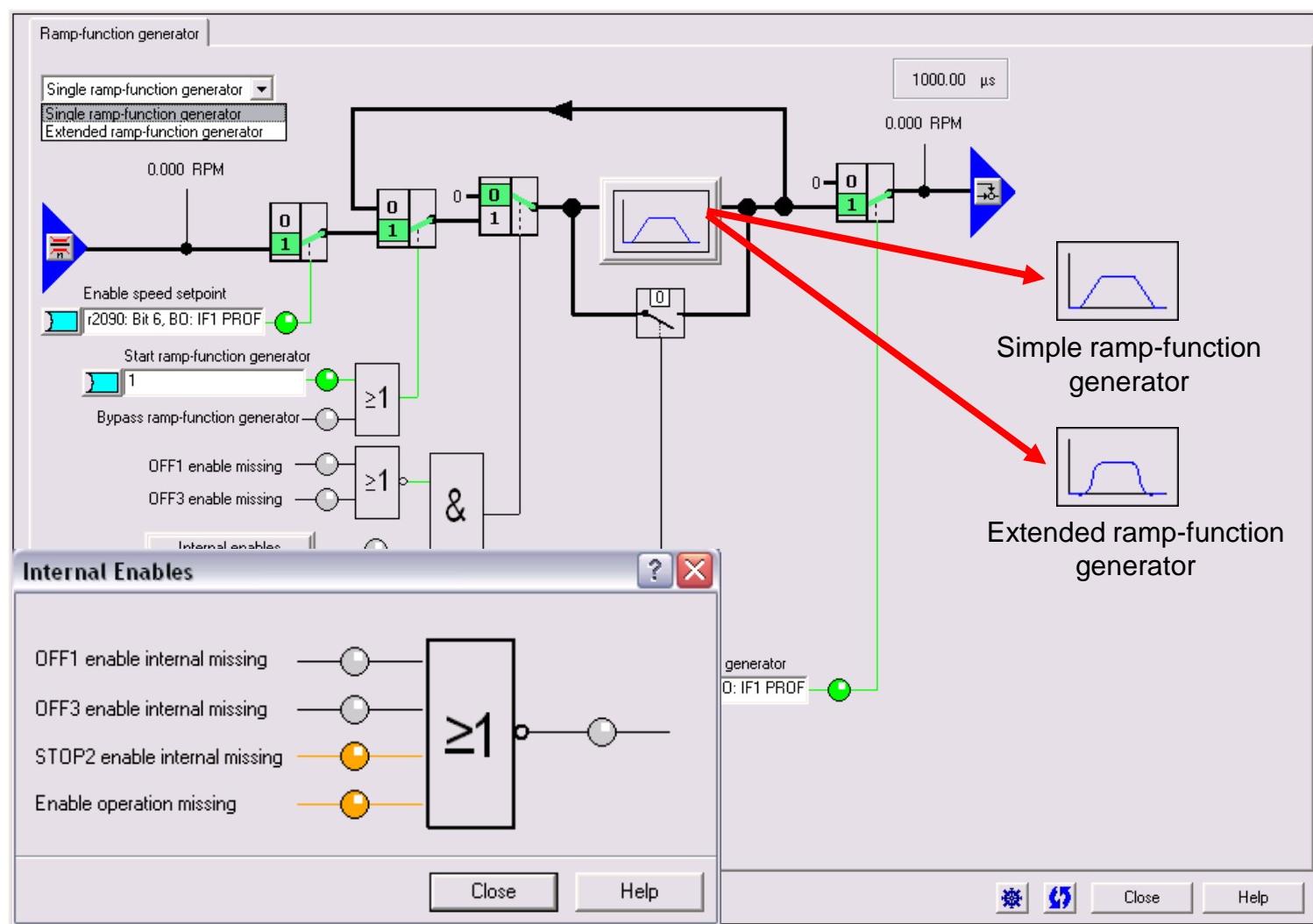


Ramp-function generator



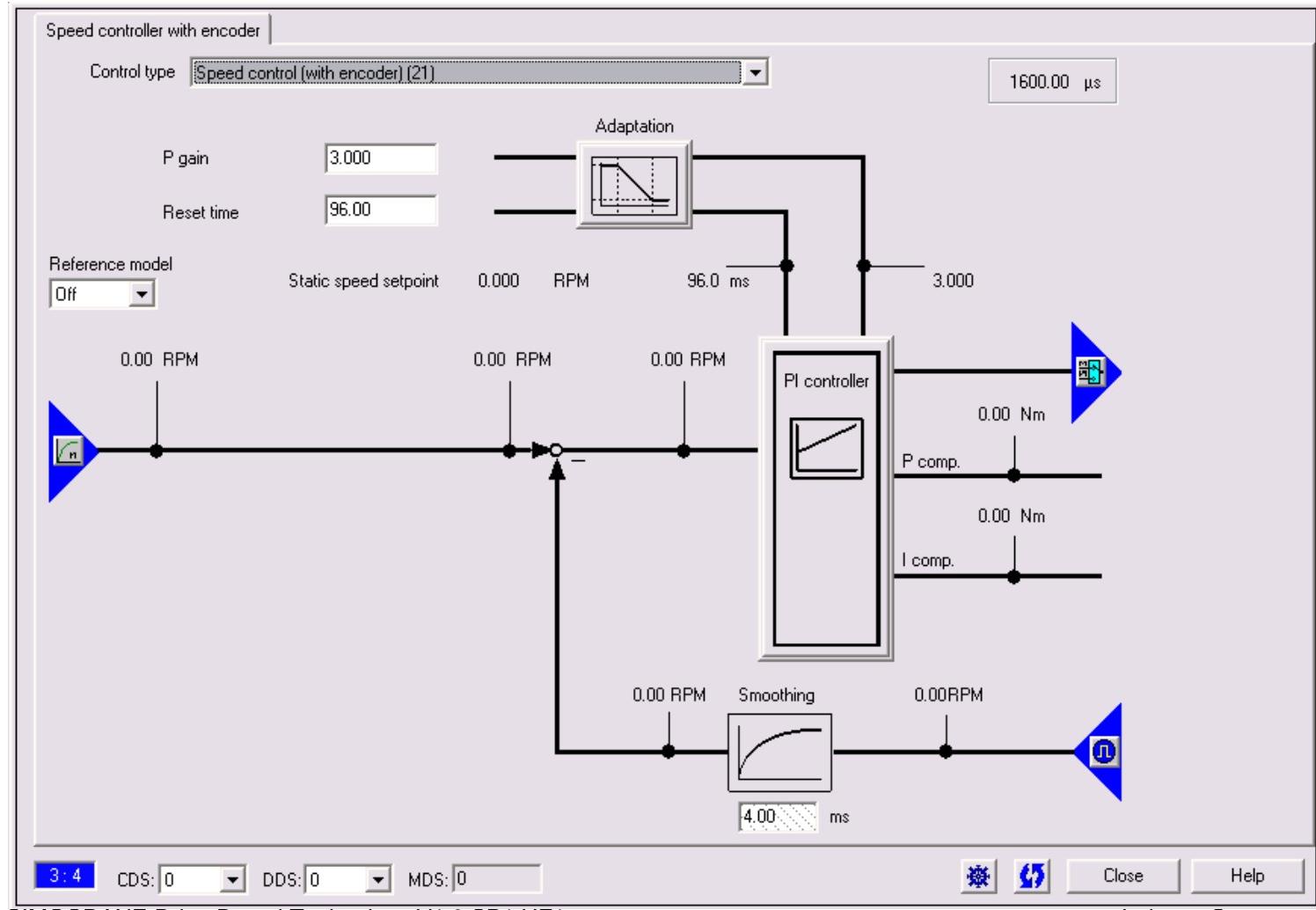
Step 4 Motor identification

Ramp-function generator



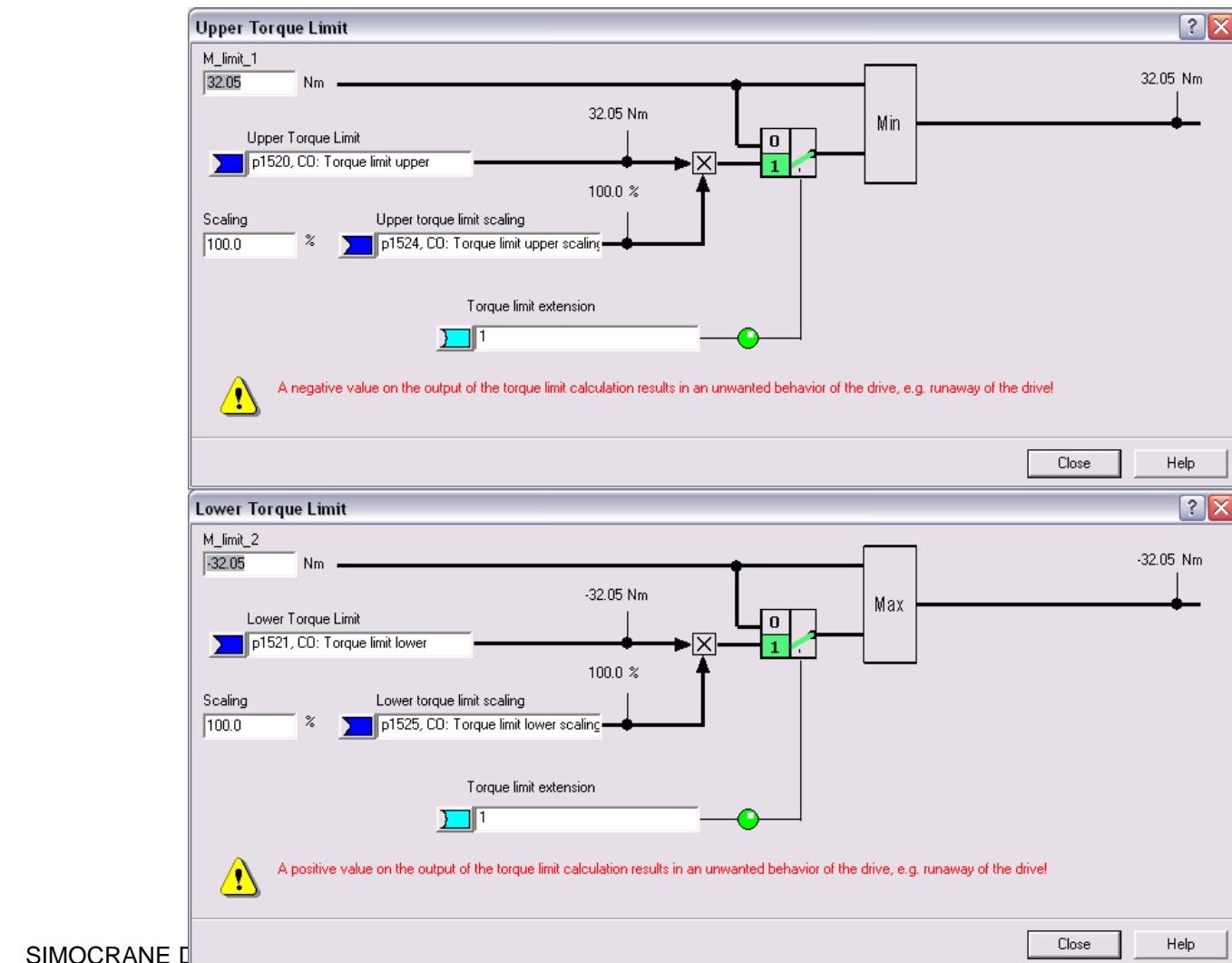
Step 4
Motor identification

Speed controller



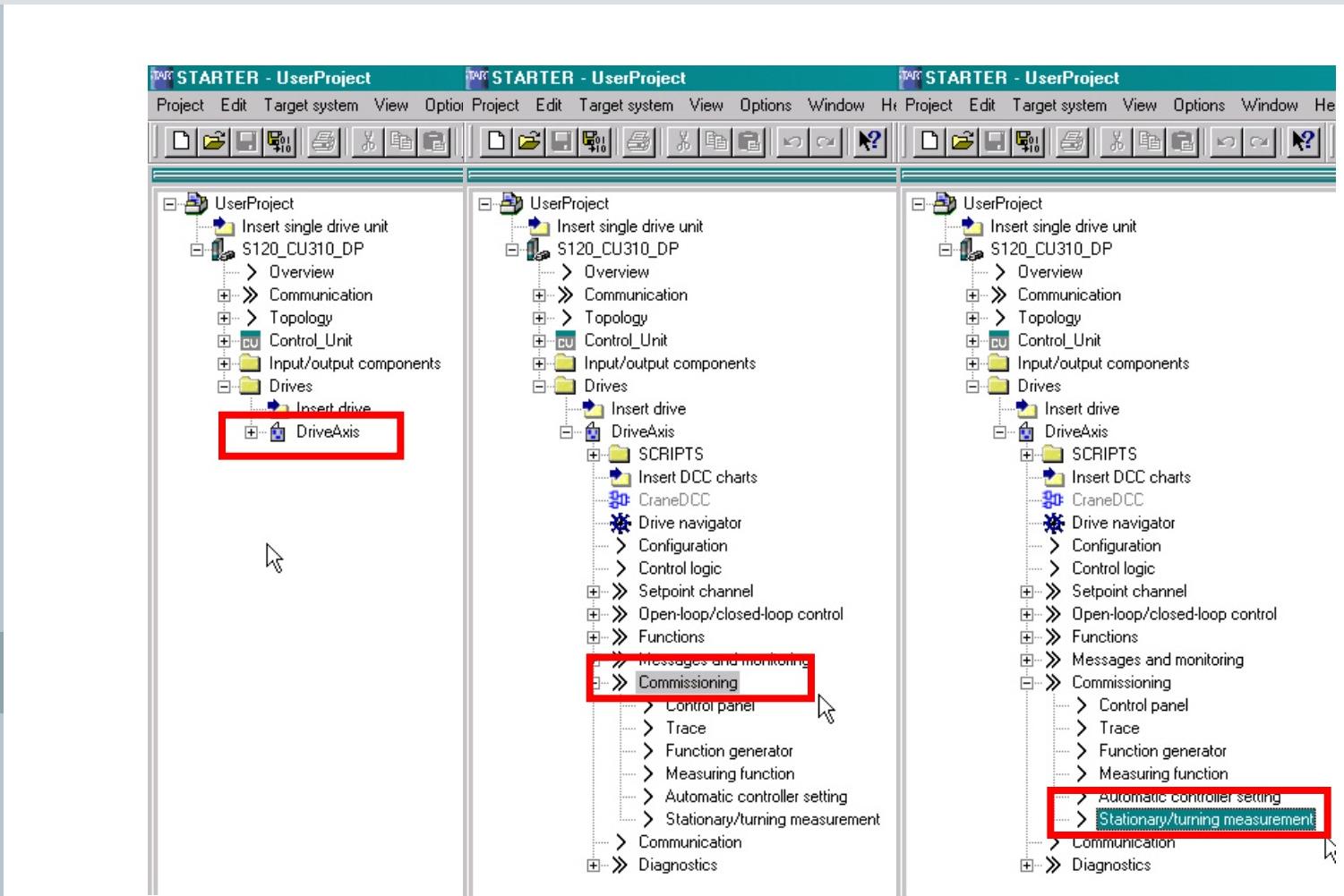
Step 4
Motor identification

Upper and Lower Torque Limit



Step 4
Motor identification

Introduction stationary measurement

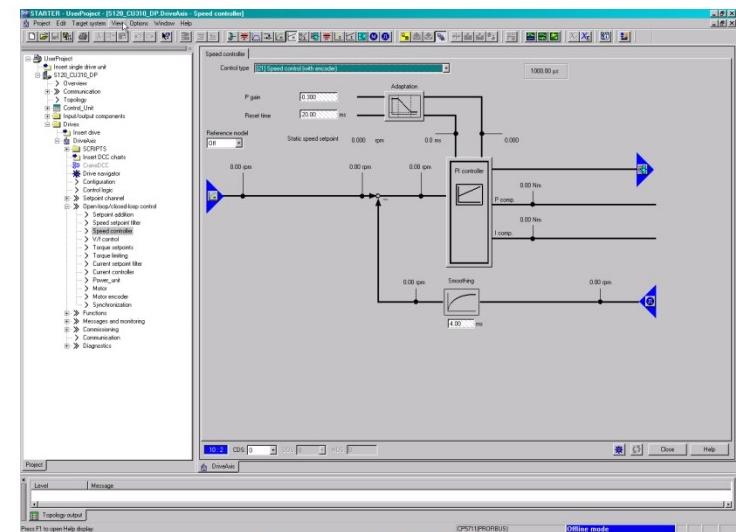


Step 4
Motor identification

Purpose of stationary measurement (refer to Chapter 6.3)

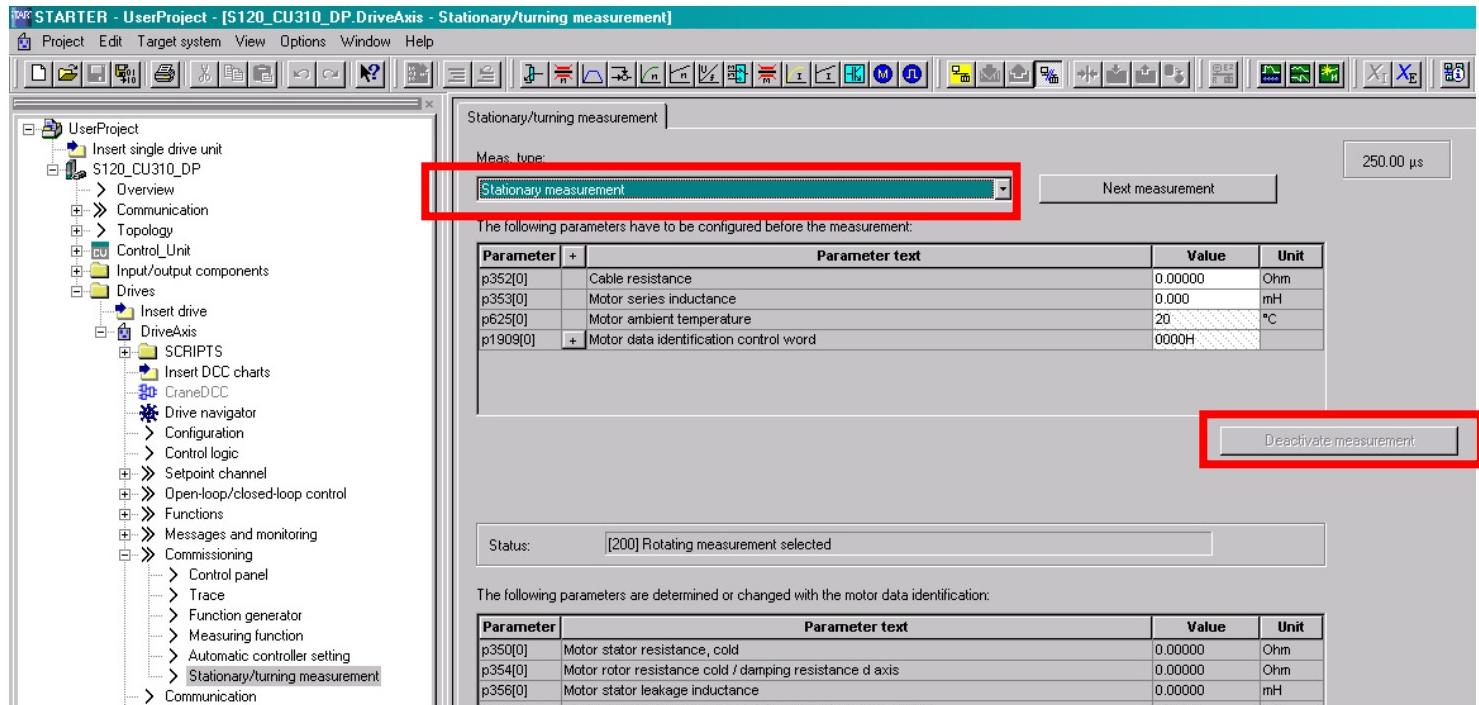
- SINAMICS Drive Object
 - Stationary measurement
 - Equivalent circuit diagram data
 - Total resistance for:
 - power cable resistance and
 - stator resistance
 - IGBT on-state voltage or compensation for the IGBT lockout times
 - Control Panel (speed direction check, if necessary directional change, p1821)

Step 4 Motor identification



Start stationary measurement

1. Select stationery measurement from the drop down menu.
2. Activate measurement.



Step 4
Motor identification

Results of the stationary measurement

Step 4 Motor identification

Meas. type: Stationary measurement

The following parameters have to be configured before the measurement:

Parameter	Parameter text	Value	Unit
p352[0]	Cable resistance	0.00000	Ohm
p353[0]	Motor series inductance	0.000	mH
p625[0]	Motor ambient temperature	20	°C
p1909[0]	+ Motor data identification control word	0000H	

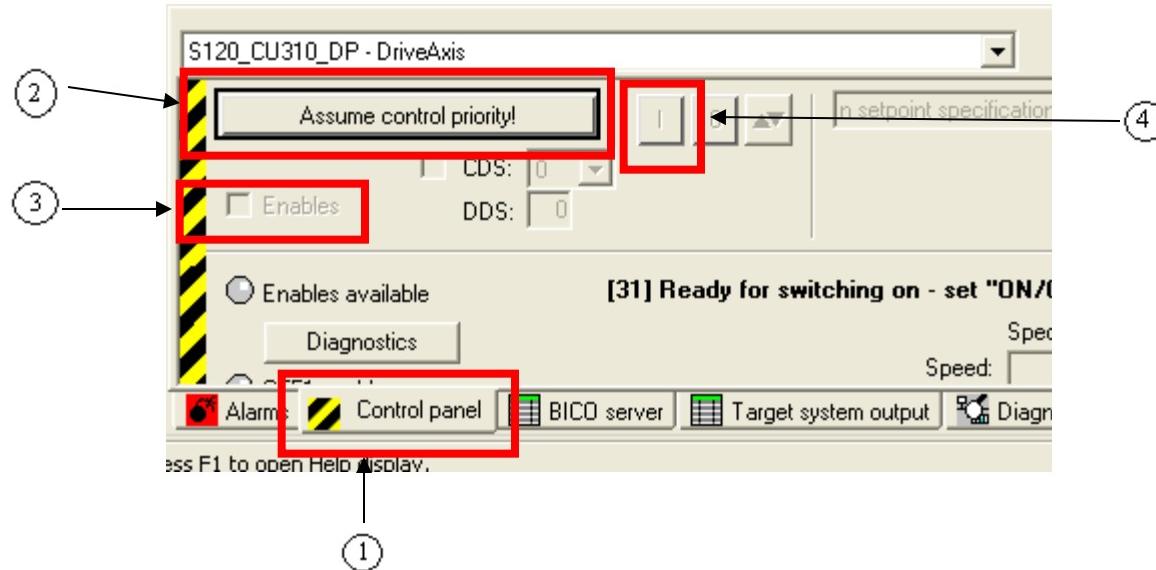
Status: [200] Rotating measurement selected

The following parameters are determined or changed with the motor data identification:

Parameter	Parameter text	Value	Unit
p350[0]	Motor stator resistance, cold	0.00000	Ohm
p354[0]	Motor rotor resistance cold / damping resistance d axis	0.00000	Ohm
p356[0]	Motor stator leakage inductance	0.00000	mH
p358[0]	Motor rotor leakage inductance / damping inductance, d axis	0.00000	mH
p360[0]	Motor magnetizing inductance/magn. inductance, d axis saturated	0.00000	mH
p1825	Converter valve threshold voltage	0.6	Vrms
p1828	Compensation valve lockout time phase U	0.00	µs
p1829	Compensation valve lockout time phase V	0.00	µs
p1830	Compensation valve lockout time phase W	0.00	µs

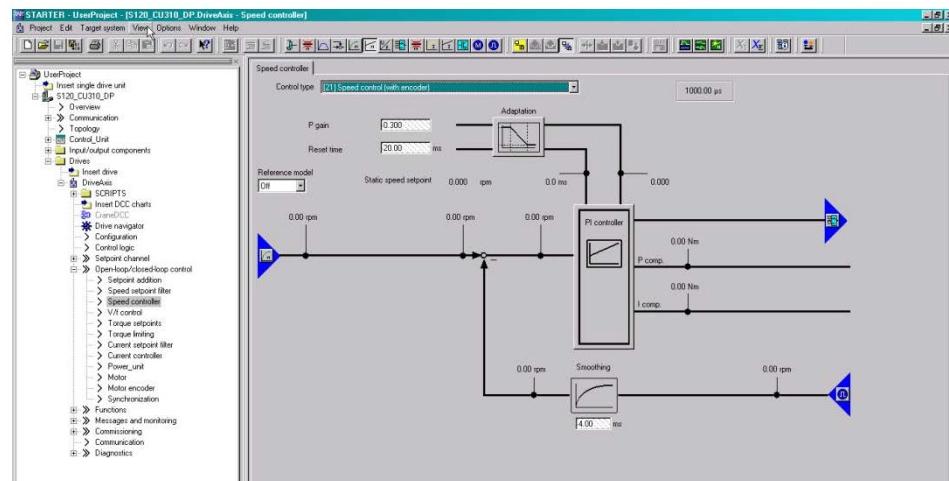
Start stationary measurement

1. Select control panel.
2. Select assume control priority.
3. Tick the enables box.
4. Select the green I button and the test begins.



Purpose of rotating measurement (refer to Chapter 6.3)

- SINAMICS Drive Object
 - Rotating Measurement and Speed Controller Optimization
 - Measurement of magnetization characteristic
 - Measurement of magnetization current
 - Speed controller optimization
 - Acceleration pre-control setting
 - Setting for ratio between the total moment of inertia and that for the motor



Step 4
Motor identification

Start turning measurement

1. After stationery measurement select deactivate measurement.
2. Then select next measurement.
 - Repeat steps taken for stationery except select turning measurement with encoder from the drop down menu,

Stationary/turning measurement

Meas. type: 250.00 µs

Turning measurement with encoder

Next measurement

The following parameters have to be configured before the measurement:

Parameter	+	Parameter text	Value	Unit
p1959[0]	+	Rotating measurement configuration	001fH	
p1961		Saturation characteristic speed to determine	40	%
p1965		Speed_ctrl_opt speed	40	%
p1967		Speed_ctrl_opt dynamic factor	100	%

Status: --

Activate measurement

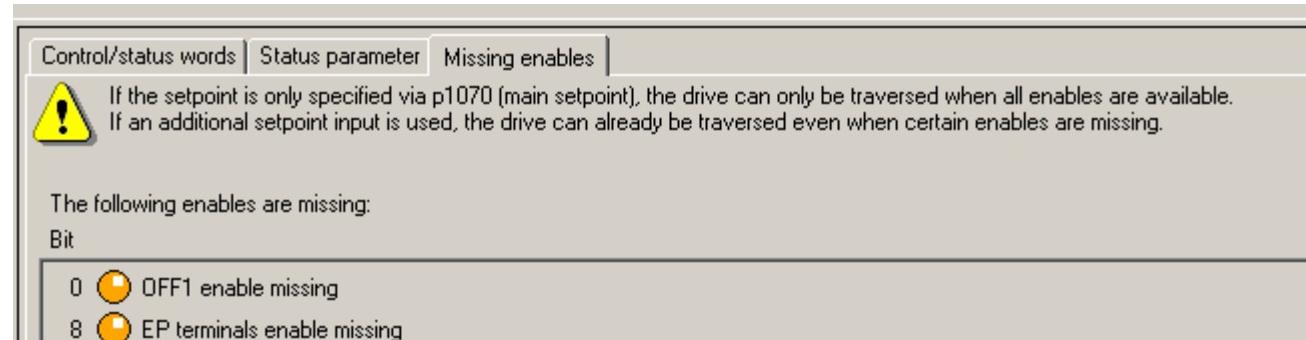
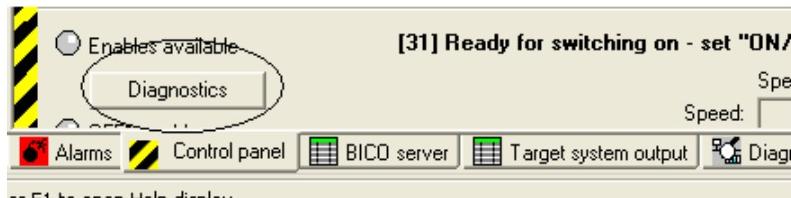
Step 4
Motor identification

2

1

Errors in rotating measurement

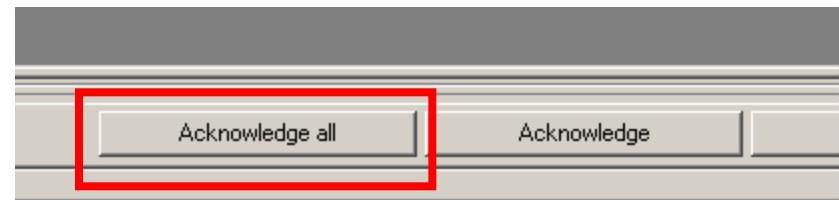
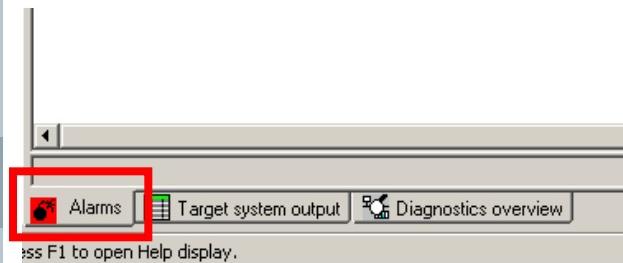
- If errors occur in rotating measurement test make sure that all steps have been followed correctly.
- Check drive diagnostics in control panel.



Errors in rotating measurement

- Use alarm screen and click on error message for help to troubleshoot fault.
- To attempt rotating test again make sure to acknowledge errors in alarms screen.

Step 4
Motor identification



Results of the rotating measurement

Step 4 Motor identification

Parameter	Parameter text	Value	Unit
p1959[0]	Rotating measurement configuration	001fH	
p1961	Saturation characteristic speed to determine	40	%
p1965	Speed_ctrl_opt speed	40	%
p1967	Speed_ctrl_opt dynamic factor	100	%

Parameter	Parameter text	Value	Unit
r331[0]	Current motor magnetizing current/short-circuit current	0.000	Arms
p341[0]	Motor moment of inertia	0.000000	kgm ²
p342[0]	Ratio between the total and motor moment of inertia	1.000	
p360[0]	Motor magnetizing inductance/magn. inductance, d axis saturated	0.00000	mH
p362[0]	Saturation characteristic flux 1	60.0	%
p363[0]	Saturation characteristic flux 2	85.0	%
p364[0]	Saturation characteristic flux 3	115.0	%
p365[0]	Saturation characteristic flux 4	125.0	%
p366[0]	Saturation characteristic I_mag 1	50.0	%
n367[0]	Saturation characteristic I_mag 2	75.0	%



Alternative to rotating measurement (refer to Chapter 6.3)

If the rotating measurement cannot be performed, it is possible to correct manually the missed rotating measurement settings:

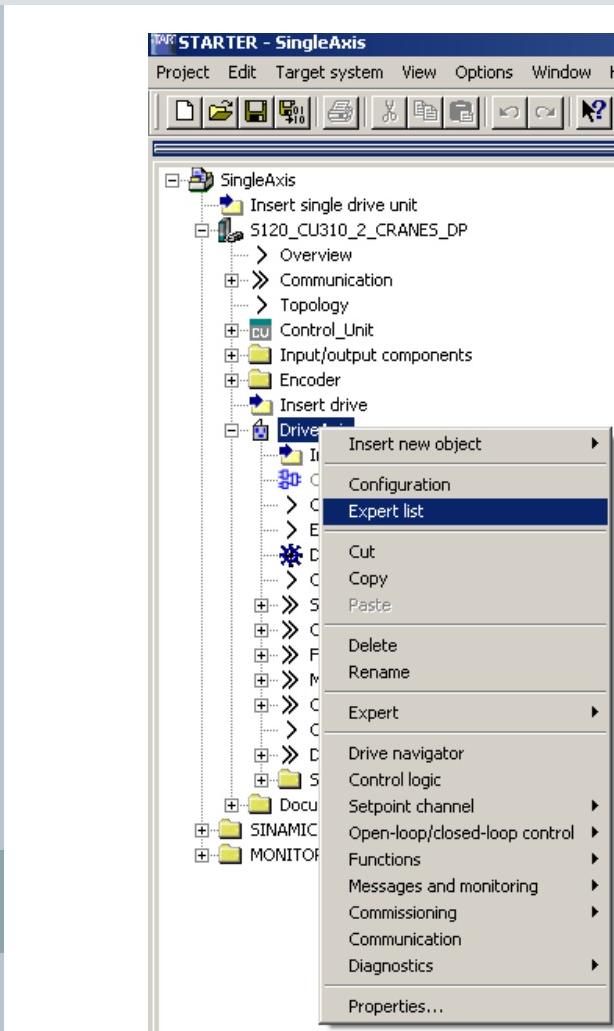
- To correct manually the magnetizing current and magnetizing inductance
- Speed control optimization by re-calculating the control parameters (p0340) or by optimizing manually the controller

Step 4 Motor identification

Refer to the manual “SIMOCRANE Drive-Based Technology”,
Chapter 6.3



Open the Expert list



Select DriveAxis with the right mouse, a new window will be opened.

Select Expert and Expert list



DCC Parameters in the Expert list

TIA STARTER - SingleAxis - [S120 CU310_2_CRANES_DP.DriveAxis - Expert list]

Project Edit Target system View Options Window Help

Enter search text | hexdecimal

Expert list

Param...	Data	Parameter text	Offline value DriveAxis
1339	r21005[0]	Computing time load of the run-time group, Run-time group 1	0.0
1340	r21008[0]	Hardware sampling times available, Hardware 1	0.250
1341	p22000	MasterSwitch_rInSpeedSetpointMS [%]	Control_Unit : r755[0]
1342	p22001	MasterSwitch_boEnableMasterSwitch	0
1343	p22002	MasterSwitch_boPositiveDeflection	Control_Unit : r722.0
1344	p22003	MasterSwitch_boNegativeDeflection	Control_Unit : r722.1
1345	p22004	MasterSwitch_rX1DeflectionParameter [%]	5.000
1346	p22005	MasterSwitch_rY1SpeedParameter [%]	5.000
1347	p22006	MasterSwitch_rX2DeflectionParameter [%]	10.000
1348	p22007	MasterSwitch_rY2SpeedParameter [%]	10.000
1349	p22008	MasterSwitch_rX3DeflectionParameter [%]	25.000
1350	p22009	MasterSwitch_rY3SpeedParameter [%]	25.000
1351	p22010	MasterSwitch_rX4DeflectionParameter [%]	50.000
1352	p22011	MasterSwitch_rY4SpeedParameter [%]	50.000
1353	p22012	MasterSwitch_rX5DeflectionParameter [%]	75.000
1354	p22013	MasterSwitch_rY5SpeedParameter [%]	75.000
1355	p22014	MasterSwitch_rX6DeflectionParameter [%]	100.000
1356	p22015	MasterSwitch_rY6SpeedParameter [%]	100.000
1357	r22016	MasterSwitch_rOutSpeedSetpointMS [%]	0.000
1358	p22030	OverSpeed_rSpeedSetpoint [%]	DriveAxis : r62
1359	p22031	OverSpeed_rActualSpeed [%]	DriveAxis : r63[0]
1360	p22032	OverSpeed_rRatedSpeed [rpm]	1500.000
1361	p22033	OverSpeed_rReferenceSpeed [rpm]	DriveAxis : r2700
1362	p22034	OverSpeed_rAfterRampGen [%]	DriveAxis : r22159
1363	p22035	OverSpeed_boEnableFieldWeak	DriveAxis : r22158.0
1364	p22036	OverSpeed_boResetLoadCurrent	Control_Unit : r722.19
1365	p22037	OverSpeed_boReset	DriveAxis : r2138.7
1366	p22038	OverSpeed_boEnableSetpointActualMonitoring	Control_Unit : r722.13
1367	p22039	OverSpeed_rOffset [%]	10.000
1368	p22040	OverSpeed_rDelayTime [ms]	250.000
1369	r22041	OverSpeed_boOverspeed	0H
1370	p22050	PreLimitSwitch_rInSpeedSetpointPLS [%]	DriveAxis : r22156
1371	p22051	PreLimitSwitch_boBit1LimitSpeed	Control_Unit : r722.20
1372	p22052	PreLimitSwitch_boBit2LimitSpeed	Control_Unit : r722.21
1373	p22053	PreLimitSwitch_boPreLimitSwitch	Control_Unit : r722.22
1374	p22054	PreLimitSwitch_rLimit1 [%]	100.000

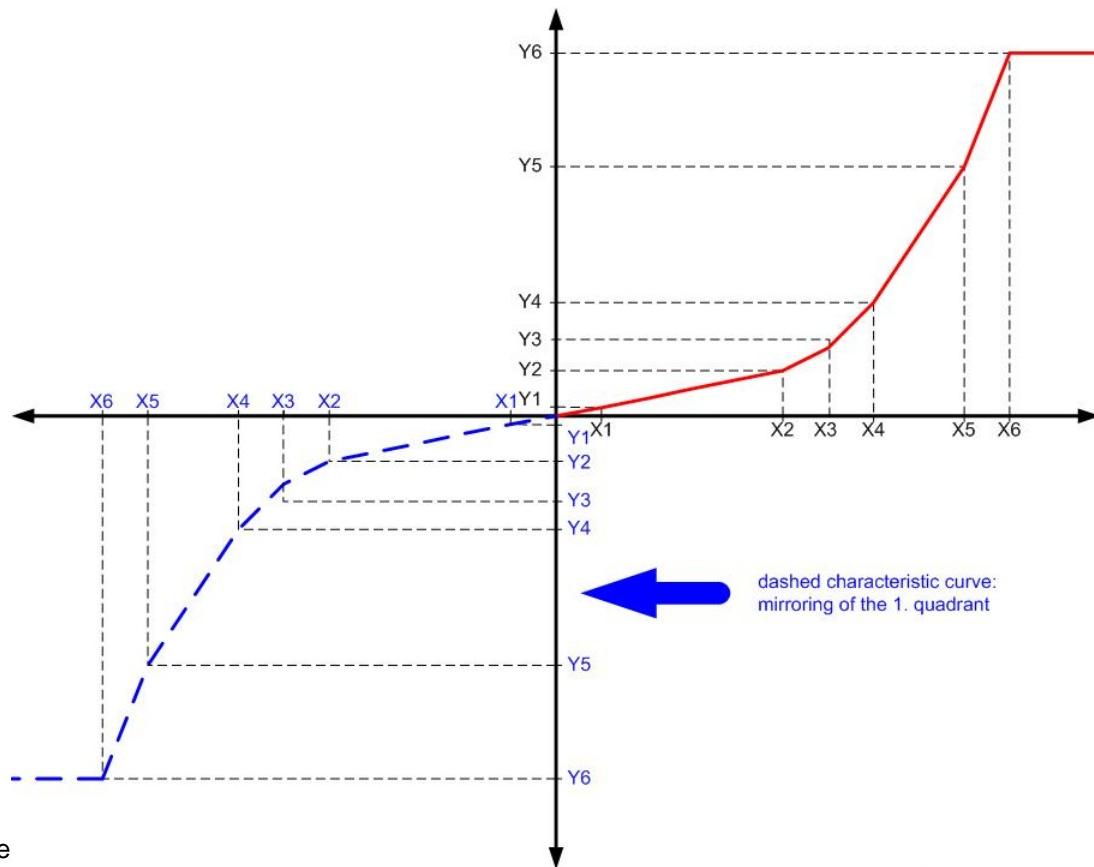
SIIMOCRANE Drive-Based Technology V1.0 SPT HFT

Industry Sector

Step 5
Parameterization
Crane DCC

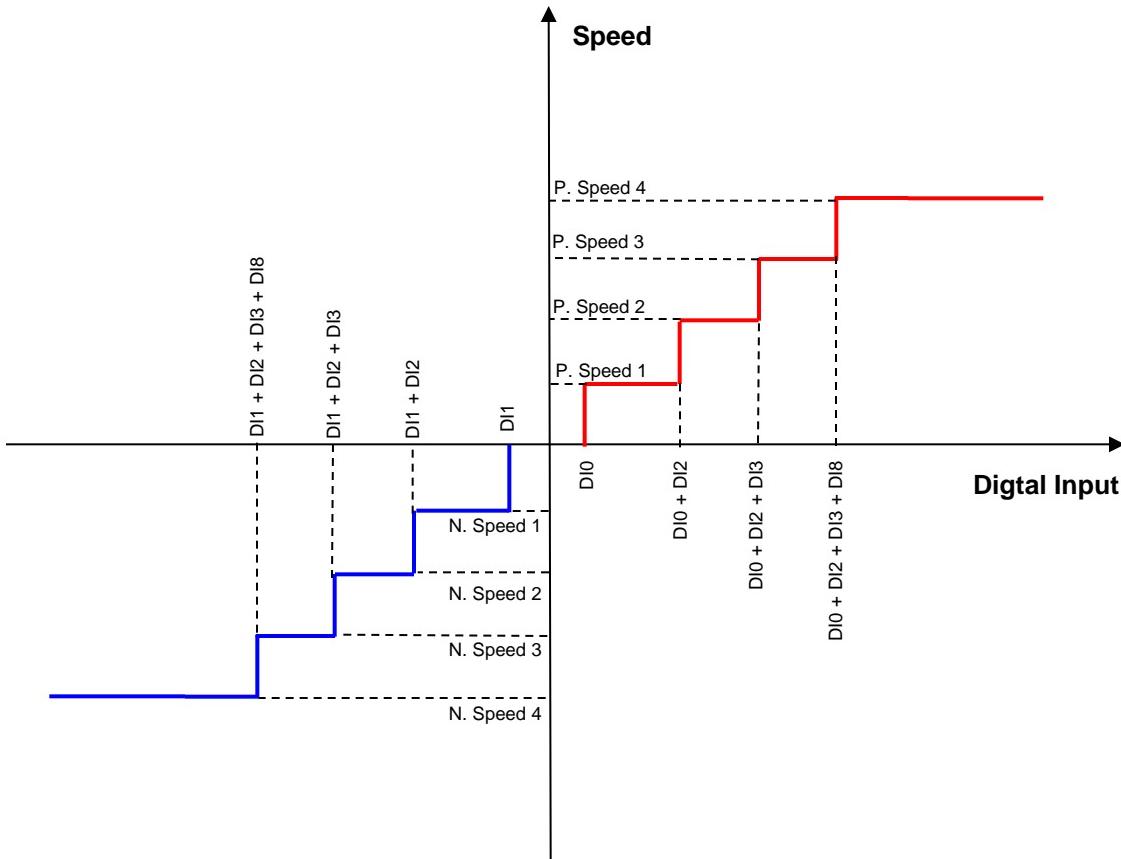
DCC_MasterSwitch (refer to Chapter 4.2)

In order that for low deflection angles lower speed setpoints are obtained than those that correspond linearly to the deflection angle, the master switch setpoint is modeled through a non-linear function. This allows the drive to be precisely positioned in the manual mode.





DCC_DigitalMasterSwitch (refer to Chapter 7.1.1)

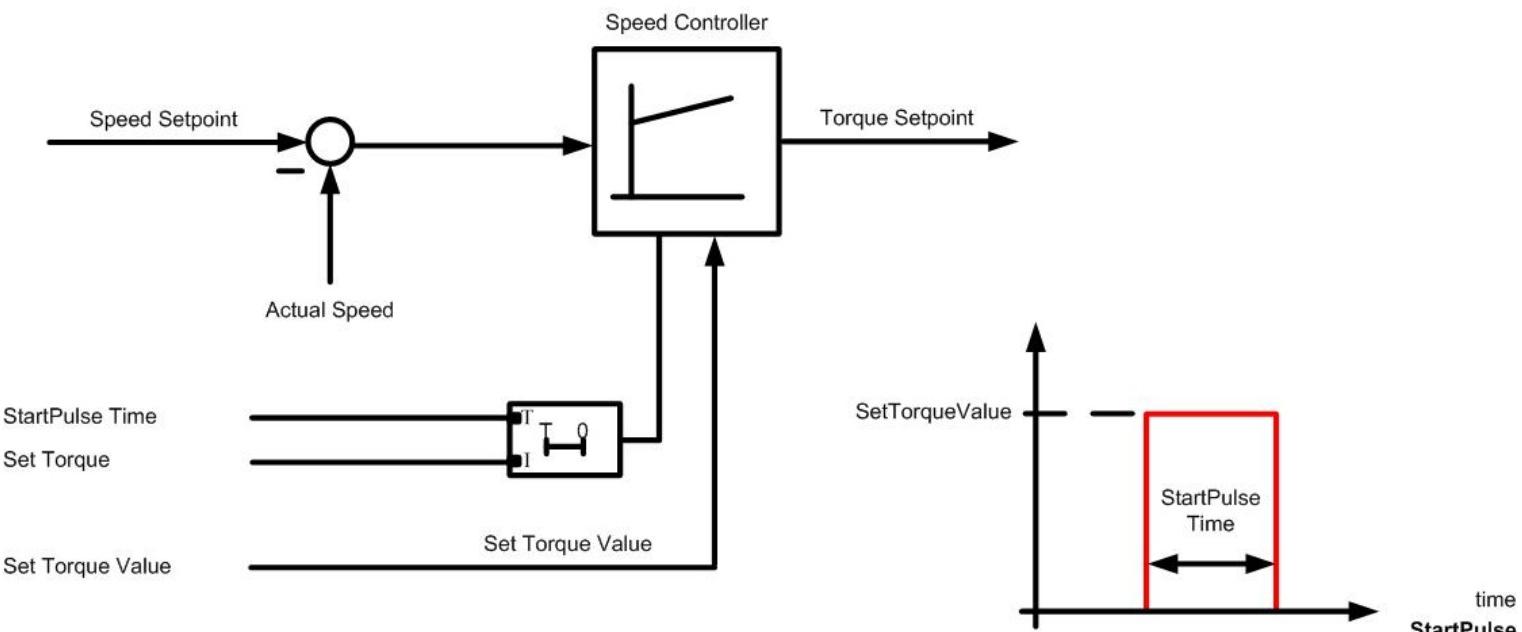




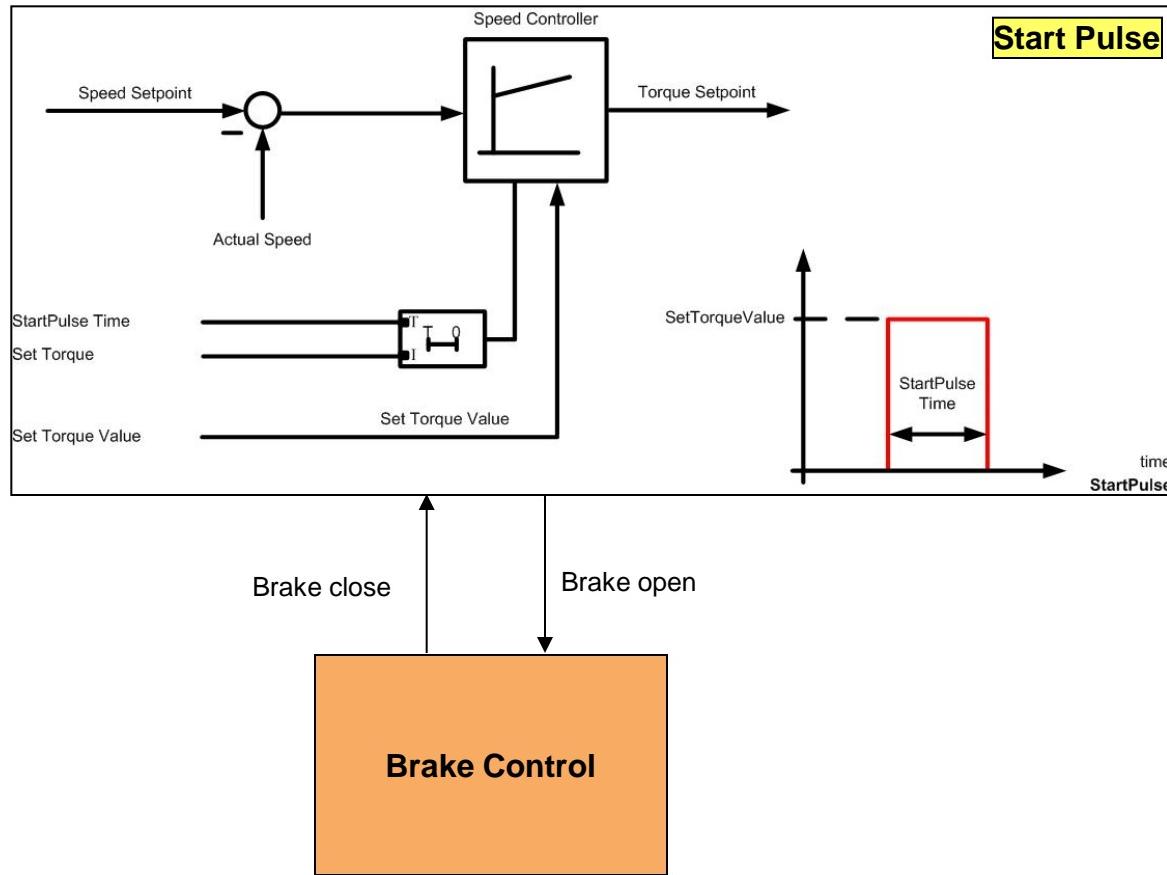
DCC_Startpulse (refer to Chapter 4.3)

For hoists, when starting (i.e. opening the hoisting gear brake) with freely suspended load, often the load undesirably sags. The reason for this is that the torque is not available when starting.

When starting with a suspended load, the torque must be quickly established.



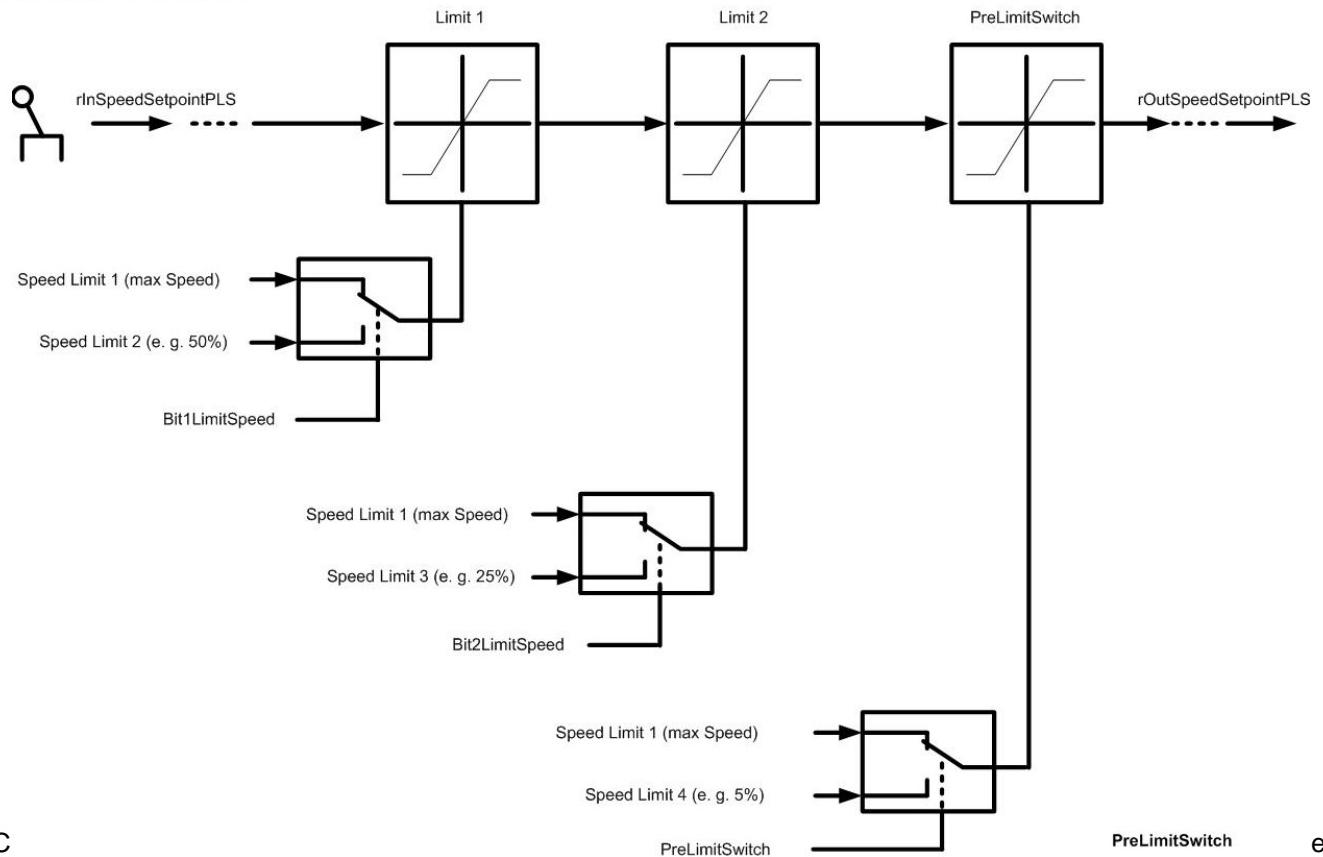
DCC_Startpulse in combination of Brake control



Step 5
Parameterization
Crane DCC

DCC_PreLimitSwitch (refer to Chapter 4.4)

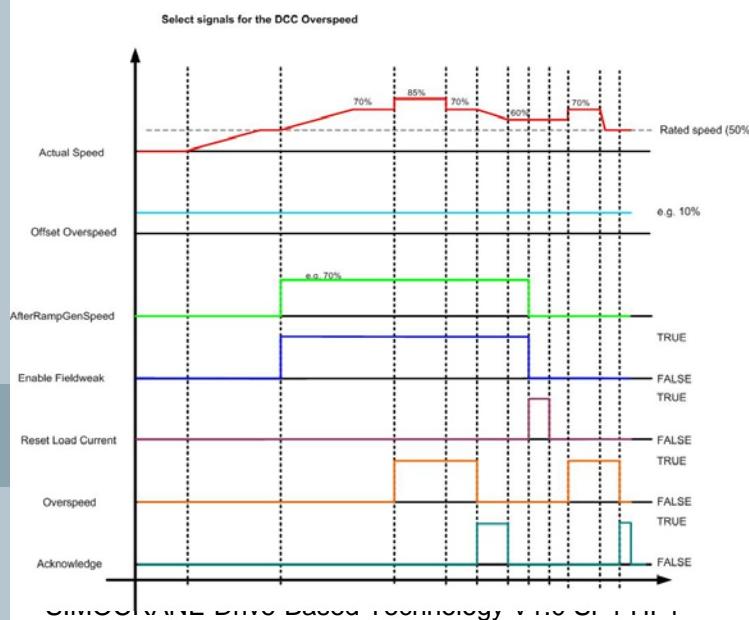
This function prevents that the drive moves with full speed to the limit switch or to the safety buffer. A total of 4 different speed limits can be configured. Interconnect the maximum speed with speed limit 1. This limits speed to the maximum value.



DCC_Overspeed (refer Chapter 4.5)

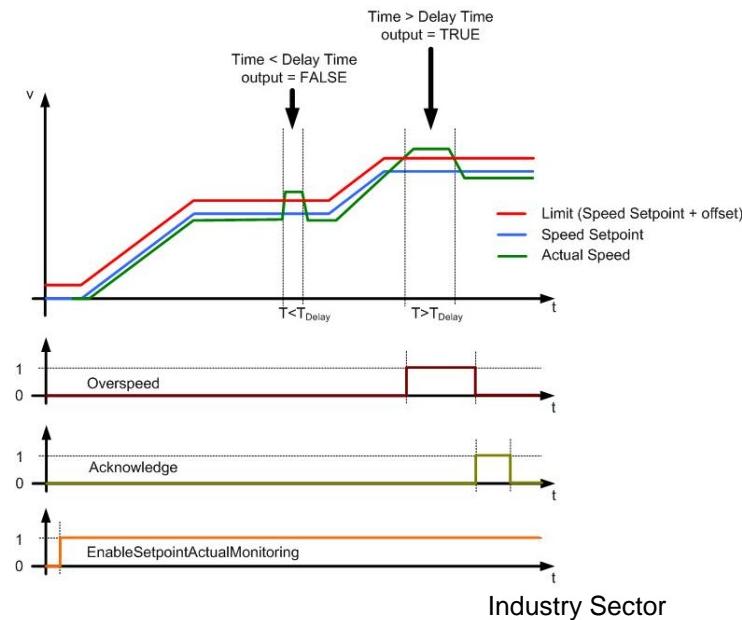
Function 1

to monitor the actual velocity for an overspeed condition. Compared value can be either in range of the rated speed or in field weakening area.



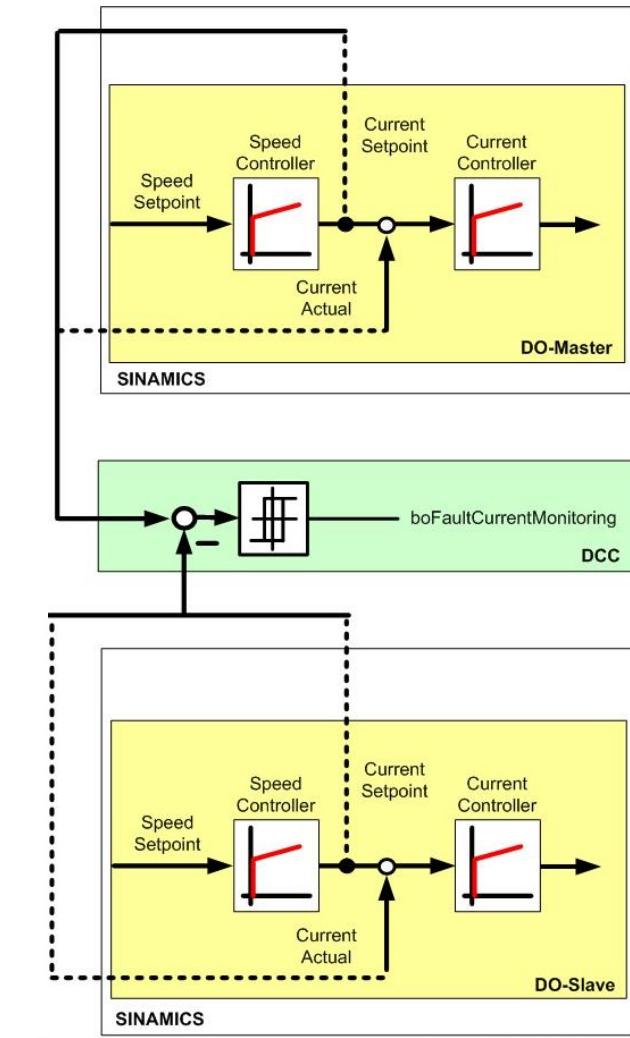
Function 2

to monitor continuously setpoint-actual value deviation





DCC_CurrentDistributionMon (refer to Chapter 4.6)



This function can be used for master-slave operation or synchronous operation. The block monitors that the total current of both drives is distributed evenly.

In synchronous operation, the current setpoint value is monitored for the two drives. In master-slave operation, the current actual values of two drives are monitored.

If the difference of the setpoint or actual currents of both drives exceeds the configured values for deviation and time, then output r22037

"boFaultCurrentMonitoring" is set.

DCC_LoadDependingFieldWeak (refer to Chapter 4.7 and 6.5)

When selecting field weakening, e.g. using the master switch, a supplementary speed setpoint for field weakening, which is permissible for the actual load, is generated.

Theoretical basics and equations

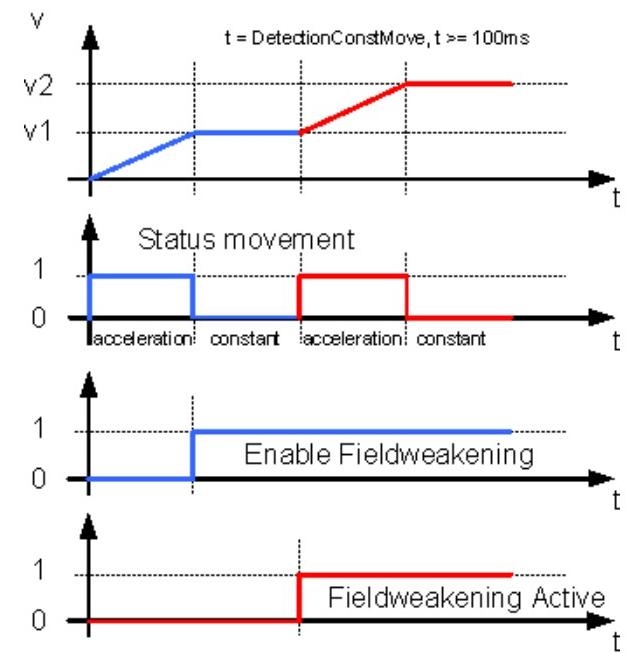
The steady-state load torque is calculated as follows:

$$MM = MLoad + MFriction$$

MM: Motor torque

MLoad: Load torque

MFriction: Frictional torque



Commissioning instructions

1. To generate the measured variables (refer to chapter 6.5.2.1)
2. Compensating the frictional torque (refer to chapter 6.5.2.2)
3. Correcting the efficiency (refer to chapter 6.5.2.3)
4. Calculating the physical size of the load (refer to chapter 6.5.2.4)

After commissioning save the project

After the Commissioning is finished, following steps must be done:

- Copy RAM to ROM (all settings will be saved on CF card)



- If the parameter settings in the CU310 are changed online, then upload the project to PG and save the project in the STARTER.



Name	Size	Type	Date Modified
ADDON	File Folder		17.09.2010 12:57
DEI	File Folder		24.11.2010 13:04
SIEMENS	File Folder		17.09.2010 12:57
USER	File Folder		17.09.2010 12:57
CONTENT.TXT	8 KB	Text Document	06.08.2010 13:02
DESCR.IMG	1 KB	Setup Information	06.08.2010 13:02
LICENCE.TXT	2 KB	Text Document	06.08.2010 13:02
LOADDATA.TXT	2 KB	Text Document	06.08.2010 13:02
LICENSE.TXT	2 KB	Text Document	06.08.2010 13:02
LICENSE2.TXT	2 KB	Text Document	06.08.2010 13:02
LIESMICH.PDF	42 KB	Adobe Acrobat Document	29.07.2009 14:45
LIZENZ.TXT	2 KB	Text Document	06.08.2010 13:02
OPTBOARD.IMG	1 KB	Setup Information	06.08.2010 13:02
PT_LOAD.001	386 KB	001 File	06.08.2010 13:02
PT_LOAD.003	1 KB	003 File	06.08.2010 13:02
PT_LOAD.004	7.139 KB	004 File	06.08.2010 13:02
PT_LOAD.005	2 KB	005 File	06.08.2010 13:02
READ_OSS.PDF	107 KB	Adobe Acrobat Document	06.08.2010 13:02
README.PDF	39 KB	Adobe Acrobat Document	29.07.2009 14:45
README.TXT	1 KB	Text Document	06.08.2010 13:02
SIM1A8	7 KB	File	06.08.2010 13:03

- Do a copy of the complete CF flash card to the hard-disc as a backup.



SIMOCRANE Product Support

➤ SIMOCRANE Product-Support (news, FAQs, Manuals,..) in Internet

<http://support.automation.siemens.com/WW/view/en/10807397/130000>

➤ Crane Application note:

<http://support.automation.siemens.com/WW/view/de/48342008/136000>

➤ **New:** Support request via Internet (Product → Simocrane) :

<http://support.automation.siemens.com>

➤ **New:** Hotline EUROPA

– Telefon: +49 (0) 911 895 7 222

– Fax: +49 (0) 911 895 7 223

– Email: support.automation@siemens.com

➤ **New:** Hotline AMERICA

– Telefon: +1 423 262 5710

– Fax: +1 423 262 2231

– Email: support.america.automation@siemens.com

➤ **New:** Hotline ASIA / PACIFIC

– Telefon: +86 10 6475 7575

– Fax: +86 10 6474 7474

– Email: support.asia.automation@siemens.com



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